

# THE IRON AGE

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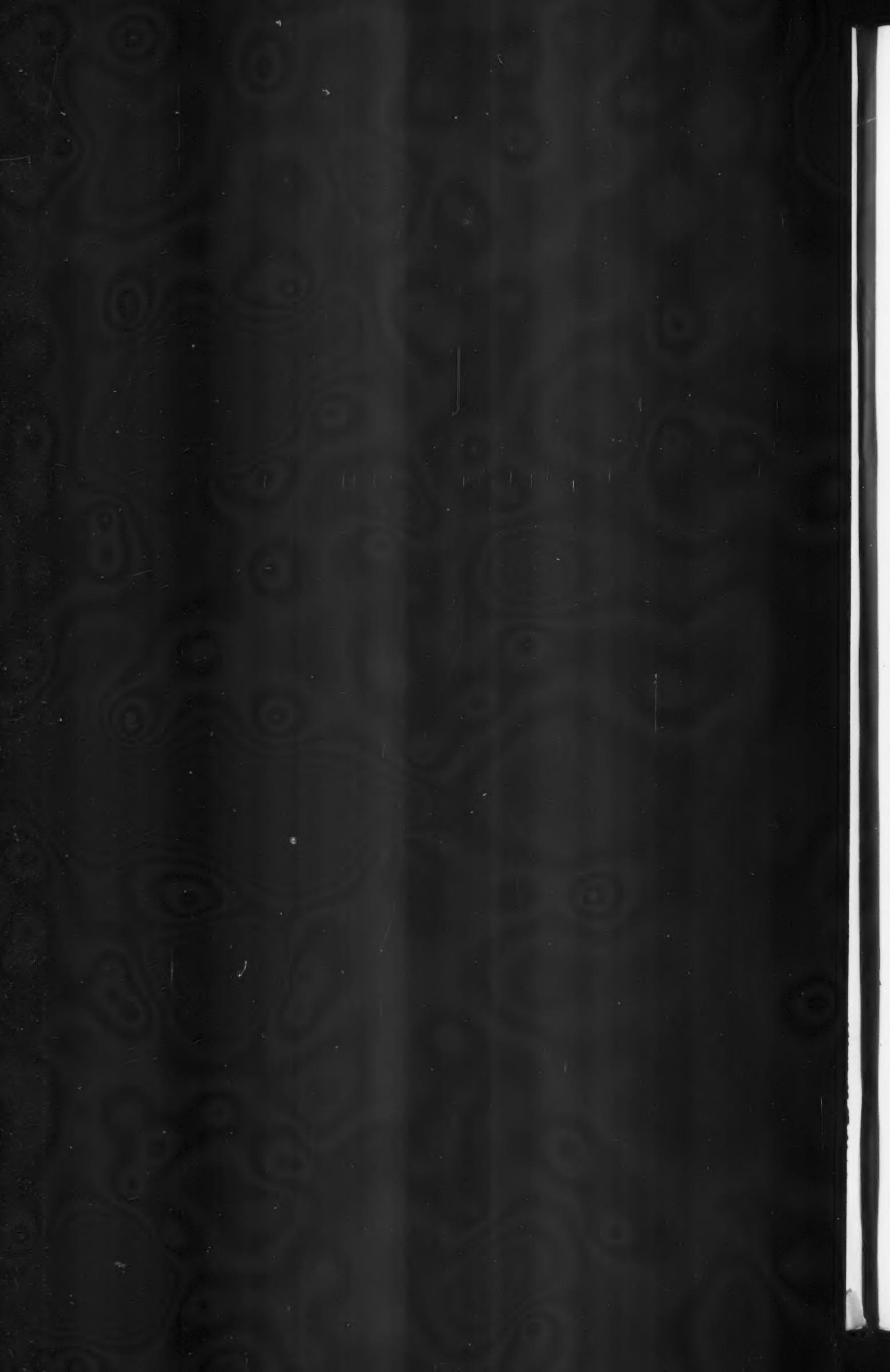
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# THE IRON AGE

New York, Thursday, August 15, 1907.

## The Mayari Iron Ore District of Cuba.

**A Remarkable Bessemer Deposit Acquired by the Pennsylvania Steel Company, Estimated to Contain Over 500,000,000 Tons.**

### Engineering Problems Worked Out in the Handling and Treatment of the Ore.

While prophecies of an iron ore scarcity in another generation or two have been rife in the past year, active exploration of a new Cuban deposit has brought to light an ore body estimated to contain above 500,000,000 tons. It is suggestive, moreover, of a coming radical revision of estimates of the world's ore reserves, put forth as having statistical value, that a single new discovery should add 5 per cent. to the figure representing the world's total iron ore supply which appeared in the report of the Swedish Government experts published last year.

Reference has already been made in these columns to the Spanish-American Iron Company's Mayari properties near the northeast coast of Cuba. This subsidiary of the Pennsylvania Steel Company, as already told, has large plans for the development of the new deposit and the shipment of the ore to the United States for use at Sparrows Point, Md., and Steelton, Pa. Not only is the find remarkable, but also the fact that prospecting began in the early part of 1904 and that the thorough exploration and proving up of the ore body and the acquisition of lands and mineral rights has been carried on with so little publicity. The Pennsylvania Steel Company interests feel assured, in ways that are indicated later in this account, that they have an exceptionally large body of Bessemer ore and the scale of their plans indicates confidence that the mining and shipping of the ore will be in progress for many years, beginning in 1909.

The importance to the Steelton and Sparrows Point plants of so great a reserve of low phosphorus ores need not be dwelt on. In the United States Bessemer ores are to-day a rapidly diminishing quantity, and so far as the Spanish-American Iron Company's Daiquiri deposits of hard ore are concerned, while considerable ore is in sight, the reinforcement that comes in the Mayari discoveries is most timely. In view of the great size of the new deposit and the guaranty it gives for the distant future, it is not improbable that the Sparrows Point plant of the Maryland Steel Company will be enlarged by the erection of one or more new furnaces. Already rails have been rolled at Sparrows Point from steel into which the new ores have entered, and these rails are now in service on the Pennsylvania Railroad.

#### Location.

The new ore range is located in the province of Oriente, formerly known as Santiago de Cuba province, in the district of Mayari, on the north coast of Cuba, about 12 miles south of the bay of Nipe. The general location is shown in the map of the eastern end of the island, in Fig. 1. Fig. 2 is an enlarged map of the Mayari and Nipe Bay districts. In being a blanket formation, the ore body most closely resembles that of the Mesaba range of Minnesota—in fact, one of the large claims taken up by the Spanish American Iron Company has been named Mesaba; but unlike the Mesaba ores those of the Mayari district begin at the roots of the trees, there being no overburden requiring to be stripped. In this, as well as in other particulars, the deposit is unique. Its great extent and the mechanical and metallurgical problems the owners have attacked in bringing on the project to its present stage, warrant a detailed account of the steps taken up to the present time. The physical and chemical characteristics of the ore presented one set of problems—particularly its high alumina

and moisture and its constant percentage of chromium. The elevation of the territory in which the ore was found and the character of the adjacent country were the chief factors in the handling and transportation problem.

#### The Ore Formation and Surface Features.

The ore body is on the summit of a gently rolling plateau, roughly 10 miles long and four miles wide, with its principal axis lying northeast and southwest. Its elevation is about 1600 ft. at the northwestern extremity, which is nearest to Nipe Bay, and it rises toward the southwest to an elevation of 2200 to 2300 ft., with one peak reaching to 2600 ft., and another to 3200 ft. The surface of the plateau is almost entirely covered by a growth of pine timber of medium size and averaging some 40 trees to the acre. There is little or no undergrowth other than ferns, and, except for a few islands, or "keys," of dense tropical forest, occurring in places where the ground is very moist, and where a certain amount of rich soil has collected, the entire plateau for 25,000 acres or more is open pine country.

The deposit of iron ore, which is chiefly in the form of red earth, covers practically the entire plateau. On the immediate surface, where it has been exposed to the weather, the ore is in the form of particles like bird shot, this being slightly superior in iron contents to the earthy ore beneath, although the difference will generally not exceed 1 to 2 per cent. The blanket of ore covers the plateau, and follows out on the points to the extremity of the gentle slope, stopping where the declivity becomes very abrupt, usually at an elevation of 1600 ft. The slopes of the two peaks mentioned are also bare of ore.

#### Early Exploration.

A trail, quite inappropriately called "Camino Real," or King's Highway, runs diagonally across the plateau, and the red iron bearing earth has been known to every passer-by for years, but no one seems to have regarded any of it, except the few inches of surface shot, and the occasional occurrence of hard ore, as a workable iron ore. After the Spanish-American War, the Spanish-American Iron Company, which was already operating mines at Daiquiri on the south coast of Santiago Province, began exploring for iron ore in the island, and deposit after deposit from Pinar de Rio Province, in the extreme west, to Santiago Province, in the extreme east, had been examined, with the almost invariable result of finding ore of excellent grade in isolated pockets, varying from a few tons to a few hundred thousand tons, and nearly always at a prohibitory distance from adequate transportation by land or sea. Moreover, the deposits of a few tons were numerous and those of a few hundred thousand tons were perhaps three in number. Every company that has opened mines in Cuba has been obliged to build its own railroad to tidewater, with shipping piers and terminal facilities, involving so large an expenditure that even the larger deposits found as a result of the above explorations were considered entirely insufficient to justify their exploitation.

This had been the experience of the Spanish-American Iron Company when, in January, 1904, it sent two of its engineers to the Mayari district to examine the hard ore to which attention had been called and samples of which, running over 50 per cent. iron, had been analyzed in the

laboratory of the company at the Daiquiri mines. The hard ore occurs at several points on the plateau at the source of the various streams where the water has washed out the finer material and the ore has cemented into lumps and solid flat masses, composed almost entirely of shot-like particles cemented together. Mining claims were located at six such occurrences and four more similar claims were subsequently added.

then taken of each six feet, the pits were superseded by borings only, and the distance between these was increased to 300 and later to 400 and 500 meters. At first 12 ft. was the maximum depth to which borings could be successfully made; but the system had so much to recommend it that it was continued and, after some experimenting, the men became so expert that they were able to bore to bed rock in practically every case, borings

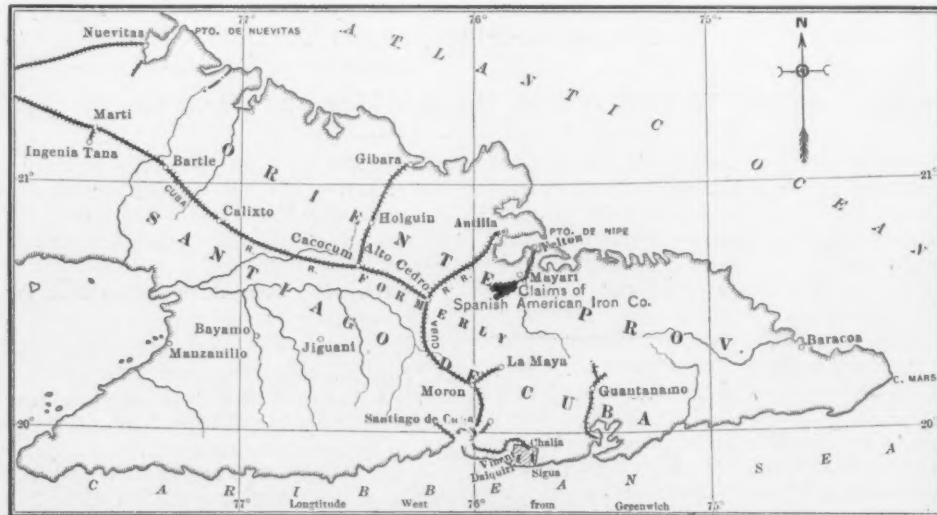


Fig. 1.—Map of the Eastern, or Oriente, Province of Cuba, Showing the Mayari Ore District on the North Coast and the Daiquiri Mines of the Spanish-American Iron Company on the South Coast.

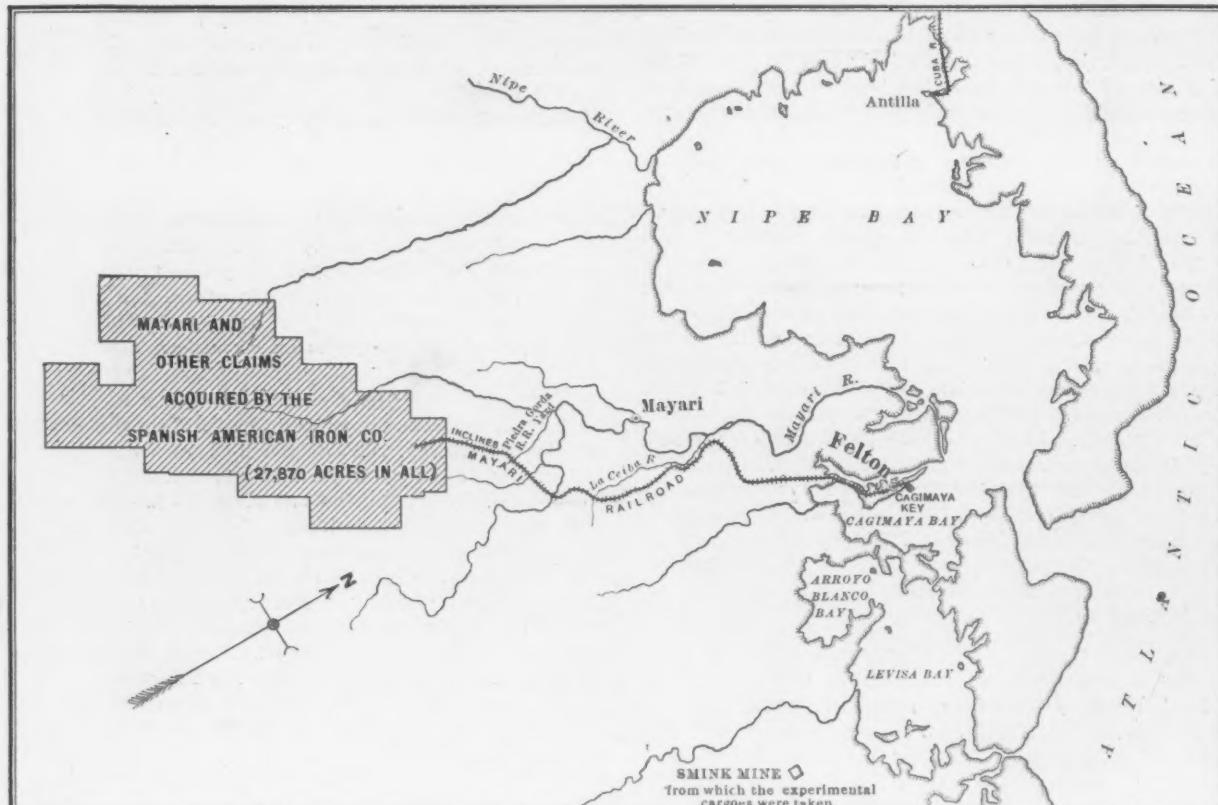


Fig. 2.—Map of the Mayari District, Showing the Spanish American Iron Company's Claims, the Railroad to Nipe Bay, and the Proposed Village of Felton on Cagimaya Key. Smink Mine Is Also Located.

#### Auger Borings.

In March, 1904, the district was visited by President Charles F. Rand, with four other engineers, and analyses of the samples taken on this trip and during the preliminary investigations showed that the surface ore was substantially of the same quality as the so-called hard ore. This led to a systematic exploration of the country by pits 100 meters apart, with borings made with a 2-in. carpenter's auger in the bottom of each pit. At first each foot of pit and borings was analyzed separately, but the ore proved of such uniform quality that samples were

having been made to a depth of 51 ft. In all, 3030 borings were made, and upwards of 15,000 analyses. Fig. 3 shows the withdrawing of the elongated auger in the taking of a sample.

By this method a large area was covered rapidly, economically and with sufficient accuracy. The work of boring was further checked by shafts, tunnels and open cuts, but even before these were made it had become evident that practically the entire surface of the plateau was of the same character. The ten original claims were abandoned and a large claim, known as the Mayari

and covering 12,575 acres, was located. To this were subsequently added 24 other claims, covering the entire plateau, and aggregating, with Mayari, 27,870 acres.

**The Extent of the Deposit.**

At an early stage in the explorations it was apparent that a very great tonnage of ore exists in this deposit. At certain points borings were made only 50 ft. apart, to

others the ore reaches a depth of 40 ft. or more, but in general the depth is reasonably uniform. A side of an open cut made in the Mesaba claim is shown in Fig. 4. A fair average depth over 18,525 acres is 15 ft., which, at 20 cu. ft. to the ton, gives 605,000,000 tons. The engineers of the company consider it not improbable that when every acre of the ore ground has been explored, this figure may be exceeded and regard it as certain that not



Fig. 3.—Prospect Boring on the Mayari Claim, Using 2-In. Augers and Extension Rods.—Drawing the Auger.

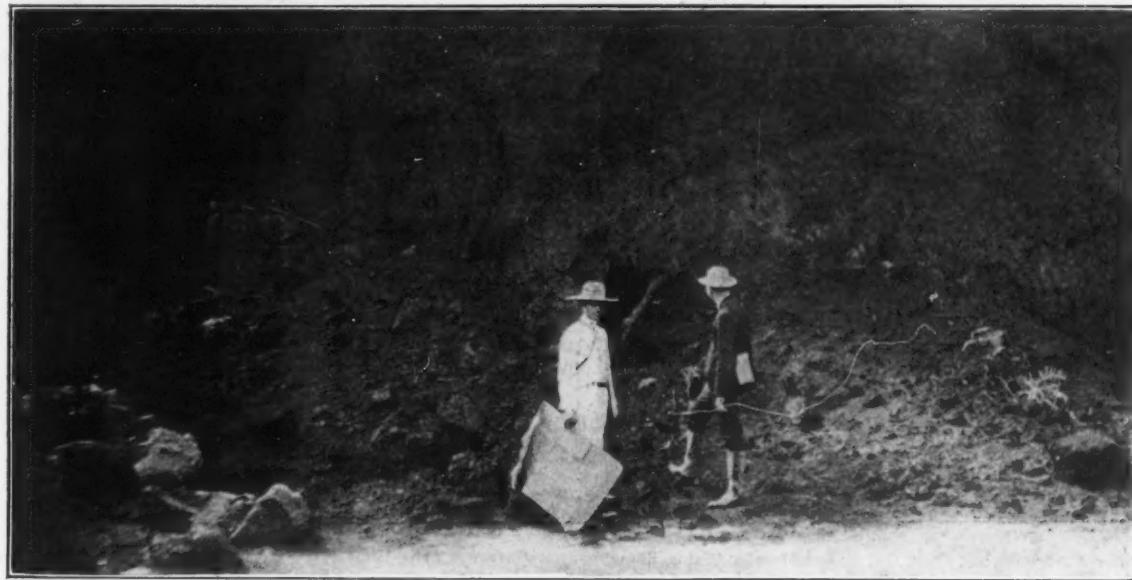


Fig. 4.—Face of Ore in the Mesaba Claim.

determine the topography of the underlying rock, with a view to the most economical working of the ore body; but the greater part of the later borings were spaced 1000 ft. apart. In this manner 10,000 acres were covered in 1904 and 8500 acres in 1905. By July, 1904, over 53,000,000 tons was calculated as in sight. The earlier pits and borings reached a depth of 5 to 12 ft., the bottom generally in ore; but all the 1905 work was carried to bed rock. No attempt was made to cover every acre of the ore ground, as an enormous tonnage was already sufficiently assured. The 1905 borings averaged 16.93 ft. in depth of ore. The underlying rock is serpentine, partly decomposed, and in some places so soft that the auger will enter. This rock outcrops in a few places, and in

less than 500,000,000 tons of ore accessible for economical mining exists on the plateau.

**Quality of the Ore.**

The ore is generally a limonite, varying from dark red to yellow in color. The latter color is found at greater depth, but there is no difference in chemical analysis. Some analyses indicate the existence of hematite with limonite. About 5 per cent. of the borings are in material below 27 per cent. in iron and high in silica or alumina, or both. This can be avoided in mining.

Omitting the above and also the borings which were made at intervals of 50 ft. at points where the ore was known to be 1 or 2 per cent. above the average, a representative general sample runs as follows:

	Samples.	Per cent.
Iron dried at 212 degrees F.	918	46.03
Silica	918	5.50
Alumina	889	10.33
Chromium	889	1.73
Phosphorus	889	0.015
Hygroscopic water	61	31.63
Combined water	37	13.62

The above may be regarded as correctly representing

caused by the action of water and sun. These occurrences while local will aggregate several million tons. Second, is the shot ore, which while forming a large total tonnage could not be mined separately, as it consists of from an inch to as much as a foot on the immediate surface. Finally, there is the great bulk of the deposit, which is an earth dark red, through light red to yellow in color.



Fig. 5.—Smink Mine Loading Into Cars Ore for Sample Cargoes.



Fig. 6.—A View in the Open Cut in the Mesaba Claim, Showing the Nature of the Underlying Rock. Ore Begins at the Roots of the Trees.

the quality of the ore. The uniformity of the deposit is shown by the following table:

Analyses.	Per cent.
10 to 20 per cent. iron	4
20 to 30 per cent. iron	2
30 to 40 per cent. iron	6
40 to 43 per cent. iron	6
Above 43 per cent. iron	82
Total	100

Ninety-four per cent. is therefore regarded as workable ore.

#### Physical Character.

Physically the ore presents some noteworthy peculiarities. First, there is the hard ore already referred to, which is an agglomeration of the shot-like particles

The large percentage of hygroscopic moisture together with the high alumina contents gives a clay-like consistency to the entire mass. In shafts 20 ft. deep, which were sunk more than two years ago, the sides are still vertical and intact and every pick mark is still visible; this is also the case in the sides and roof of the tunnel. This is somewhat remarkable in view of the fact that the ore carries 45 per cent. of water. In the open cuts where the faces are exposed to the direct sun there has been some little caving.

#### The Problems to Be Dealt With.

It is evident that this Mayari deposit presents new features both mechanical and metallurgical, from the mining of the ore to the final rolling of the finished steel product. Its soft nature and blanket form invite the use

of steam shovels, but its tenacity, amounting almost to stickiness, has made it necessary to design a new form of car for its transportation, as it will not tip from any known form of dump car. The high percentage of water contained make some sort of drying process indispensable as preliminary to shipment, to avoid paying freight and duty on water. The finely divided, almost dust like, character of the dried ore requires that this drying process shall go a step further and produce an agglomerated product in the form of clinker or bricks, to make it suitable for use in the furnace. The alumina content produces an unusual blast furnace slag and one which demands careful and intelligent operation. The chromium present, going into the pig iron, must be largely eliminated from the steel, and the characteristic behavior of the small remaining quantity of chromium in combination with varying percentages of carbon required to be studied in detail.

By careful experiment, carried on in the past few years, it is stated that these various difficulties have all been solved, regard being had to the commercial aspect of the problem and the necessity of economical operation at all stages of the mining, transportation and treatment, in order that this ore may be turned into steel at a cost favorable to competition with any of the higher grade ores. The experiments with drying and clinkering plant and with the elimination of chromium in the steel making process have been carried on at the Sparrows Point and Steelton plants of the Pennsylvania Steel Company.

For studying the ore by actual tests in the furnace and mills a large sample was necessary; but the difficulty of securing pack animals and the cost of transporting the quantity required over rough trails and roads by pack mules, and then by lighters for a total distance of 16 miles, were almost prohibitory. After some search a small deposit of ore, practically identical with the Mayari ore, was found within two and a half miles of Levisa Bay, just east of Nipe Bay. It is known as the Smink mine and is indicated on the map in Fig. 2. Over 5000 tons of this ore was shipped in three schooners and furnace runs were made and steel was manufactured. In Fig. 5 the loading of ore at the Smink mine is illustrated. In having the ore immediately at the surface, the Smink mine is typical of the entire Mayari deposit, as far as explored. Fig. 6 shows the full depth of one cut in the Mayari deposit, from the roots of the trees to the serpentine rock.

#### Transportation to Tidewater.

Once the existence of a large ore body had been demonstrated the engineers of the company studied in detail the question of transportation and the best outlet to tidewater. Nipe Bay is the natural point of shipment and Cagimaya Key (Fig. 2), an island of about 370 acres, separated from the main land by a narrow estuary, was finally fixed upon as the most suitable location for a railroad terminal and docks. The plateau on which the ore is found drops off abruptly and from its foot to the sea, a distance of about 10 miles, the fall is only about 180 ft. The difference in elevation near the mines could not be overcome, therefore, by any railroad except a very long one, and the use of inclined plane cable roads in combination with a railroad was decided on.

#### The Inclines.

It is expected to mine the ore by steam shovels and load it into 50-ton cars. These will be lowered by double-track, inclined cableroads to a yard two and one-half miles distant. Two separate inclines are contemplated, connected by 4000 ft. of level track. The inclines will be laid with 90 lb. steel rails and operated by "barney" cars, running on a narrow-gauge track of 60-lb. rails, inside the main track. The two barneys to which the main cable is to be attached will be connected by a tall rope running around a sheave at the base of the incline.

Two cars will be lowered at a time, over a maximum grade of 25 per cent., and simultaneously two empty cars will be raised on the other track. The acceleration due to gravity is sufficient for the loaded cars to raise the empties, but powerful winding engines will be installed at the head of each incline to provide for rapid starting and better control. The main hoisting rope, 2½ in. in

diameter, will be continuous from barney to barney, and pass around the drums of the winding engine in the usual manner. The smaller tail rope, connecting the rear ends of the two barneys, is for convenience in manipulating them. At the foot of the incline the barney will drop into a pit and the loaded cars will run out over it to the yard track, while the empties to be hoisted on the next trip are fed by gravity past the barney-pit, to be picked up by the barney as it comes from the pit in its up trip. From the foot of the upper incline to the head of the lower, a locomotive will shift the cars over the 4000 ft. of intervening level track, but at the foot of the lower incline no locomotive is required, as, by an ingenious arrangement of yard tracks the loaded cars from either incline track will run off to the same yard track where they are coupled up into a train, while the empties in the yard feed in by gravity to either incline track.

The inclines will have a capacity of 6000 to 8000 tons in 10 hours, and will be so arranged that the size of the rope may, when necessary, be increased to carry three cars, thereby increasing the capacity 50 per cent. When further additional capacity is required the upper incline, which is 7000 ft. long, can be divided at about the center, and by the installation of a third winding engine there will be three inclines, thus increasing the total capacity by somewhat less than an additional 50 per cent.

#### The Railroad to the Dock.

From the foot of the lower incline a railroad 13 miles long, with a maximum gradient of one-half of 1 per cent., all grades favorable to the traffic and a maximum curvature of six degrees, will transport the ore in 30-car trains to the terminal town of Felton, on Cagimaya Key. The railroad, which is now under construction, is being laid with hardwood ties and 90-lb. rails, and heavily ballasted. All bridges, except a trestle across the narrow estuary which separates Cagimaya Key from the mainland, are to be of steel, culverts of concrete and drains of cast iron pipe. With the easy curvature, light grades and a substantial track construction, the cost of operation of the railroad is expected to be low.

#### Ore Drying Plant.

At Felton, the tidewater island terminus, the ore will be dried and stockpiled for shipment. The ore cars will open on one side, and cranes will lift the entire car body off the trucks by the other side, so that the bottom of the car may, if necessary, be raised to a vertical position, and the ore will slide out into a long trough. From this trough it will be lifted by a 15-ton grab bucket, operated from a bridge or gantry, and stored or fed directly to the drying plant. The product of this plant will be carried by an electric transfer car to the storage for clinkered ore. This will be located with its main axis parallel to the shore line and as close thereto as conditions permit. The transfer car will deposit the dried ore in another trough from which a second bridge with a 15-ton grab will lift it for storage in a stock pile, or, by means of an extension boom reaching out over the water, load it from the pile into steamers lying along the water front close to the island.

#### Harbor and Coal Unloading.

A dredged channel, 3000 ft. long, 200 ft. wide and 28 ft. deep, will allow vessels to reach the shore line of the island, where a dredged basin will give 1000 ft. shore frontage and admit of turning the vessels.

As the process of drying the ore requires a large amount of coal, all of which must be imported in steamers, provision for coal discharge and storage will be made along the 1000 ft. of deep water front. The coal will be discharged by unloading machines or a bridge similar to the ore bridge and stored in a pile near the shore and in continuation of the ore pile.

The cranes, bridges and unloading devices will all be electrically operated, and an electric power and lighting plant, together with machine, blacksmith, boiler and carpenter shops, foundry and terminal railroad yards, forms part of the installation at the Felton terminal.

#### Mining and Shipping Villages.

Both at the mines and at Felton, villages will be required for superintendents, clerks, mechanics, trainmen,

foremen and laborers, as no settlement exists nearer than the town of Mayari, about half way between the mines and the bay. As the greater part of the labor will be more or less skilled, a large number of small houses will be required and very few of the barracks usual in the mines in Cuba.

The great size of the ore deposit and the consequent permanent nature of the work will permit a substantial class of construction, both for working plant and dwellings. The villages will be provided with water, light and a sewerage system. The situation of Felton, on a level island, 15 ft. above the bay, and that of the mining village, in the pines, and commanding from its elevation of 1600 to 1700 ft. a splendid view of the Mayari valley, five bays and the ocean beyond, both lend themselves to a treatment from the view point of landscape engineering. On the plateau the elevation is such that the climate is favorable for the continuous working of the mines. The nights are so cool as to make blankets a necessity. At the dock terminal of the railroad employment will also be given the workmen continuously, unlike the Lake Superior ports, which are closed five months of the year by ice.

#### Timber.

The pine timber on the plateau extends over the entire 27,000 acres of the ore lands, with the exception already noted of a few patches of hardwood timber. Near the edge of the high land it is coarse grained with little heart and practically worthless for lumber. The remainder is workable timber, running a little over 5000 ft. board measure to the acre. The trees are small, running 12 to 16 in. in diameter, with a few up to 24 in. The height runs about 50 ft. to the first branch. There are probably something over 100,000,000 ft. of timber on the property. Lumbering operations will be carried on simultaneously with those of mining, as timber must be felled and removed ahead of the steam shovels.

#### Production.

The daily production of ore at present in view is 2500 tons of dried ore, which involves the mining and transportation to tidewater of about 4500 tons of crude ore daily. The inclines, railroads, drying plant and shipping facilities will have a capacity and equipment largely in excess of this requirement and, while ample provision has been made for their extension, this is not likely to be required, except in the case of the drying plant and shipping devices for some years to come.

E. C. Felton, president of the Pennsylvania Steel Company, in his recent letter to the company's bankers says that he believes the Mayari properties constitute a very considerable and welcome addition to the world's available supply of iron ore, and an asset of great value to the Pennsylvania Steel Company.

#### Personnel.

Those who are responsible for bringing about the results detailed above are Charles F. Rand, president of the Spanish-American Iron Company; Jennings S. Cox, Jr., general manager; George W. Pfeiffer, general superintendent; Pedro Aguilera, George A. Wright, S. A. Barratt and E. M. Holmes, mining engineers, and A. C. Reed, chief engineer of that company. The property has been visited and examined several times by E. C. Felton, president of the Pennsylvania Steel Company; Frank Tenney, assistant to the president; F. W. Wood, president of the Maryland Steel Company, and H. H. Campbell, metallurgical engineer; also by F. C. Smink, president of the Reading Iron Company, Reading, Pa. The metallurgical problems have been worked out under the direction of F. W. Wood, H. H. Campbell, J. W. Dougherty and Frank D. Carney.

A 4000-hp. electric locomotive has just been completed by the Westinghouse Electric & Mfg. Company, of Pittsburgh, Pa., designed to suit the conditions in the Pennsylvania tunnels under New York City. Between the tunnels and outside levels it will be necessary to establish mountain grades on which the traffic must be handled at high speed. This calls for a locomotive more powerful than heretofore built of any type. In the preliminary tests alternating current was taken from overhead conductors at 11,000 volts, single phase.

#### Bethlehem Special Shapes.

A 40-page, pocket size pamphlet, just issued by the Bethlehem Steel Company, South Bethlehem, Pa., is devoted to this company's special structural shapes for buildings and bridges. Details are given of Bethlehem special I-beams, rolled girder beams and rolled H-columns of open hearth steel. The characteristics of the Bethlehem special shapes rolled by the Grey universal beam mill were described at some length in the article dealing with the new Grey universal mills at South Bethlehem, which appeared in *The Iron Age* of November 1, 1906, page 1142. These mills are now about complete and ready for operation.

The tables in the new pamphlet give the following information: Weights, dimensions, areas and structural properties of minimum sections of girder beams; of the special I-beams usually rolled, ranging from 8 to 24 in. in depth; of H-column sections for all the variations in size that are rolled; also the safe uniformly distributed load in tons on Bethlehem beams for a maximum fiber stress of 16,000 lb. per square inch. The minimum sections of the special I-beams from 8 to 24 in. in depth have the same section modulus and coefficient of strength as the minimum sections of American standard beams of the same depth, but it is stated that in view of the more economic distribution of metal between the web and flange areas the Bethlehem special beams weigh 10 per cent. less than the corresponding standard section. It is stated, for example, that a Bethlehem special I-beam 15 in. deep weighing 54 lb. per foot, has a coefficient of strength of 868,100. The corresponding American standard section is a 15-in. I-beam weighing 60 lb. per foot, with a coefficient of strength of 866,100, so that for equal strength the Bethlehem beam weighs 6 lb. per foot less than the American shape, or a saving of 10 per cent. in weight. Instead of the horizontal grooved rolls of the usual beam mill the Grey mill has horizontal and vertical rolls forming the web and flanges of a beam by combined rolling operations acting at right angles. To quote from the pamphlet:

Webs of the usual standard beams are much thicker than required for an economical section. It is not practical to reduce the web thickness in the ordinary mill, but with the Grey mill the web can be reduced to the desired thickness. By adding part of the metal thus saved to the flanges, the strength of the section is maintained, resulting in a lighter section for the same strength. Heretofore the largest beam rolled in this country has been 24 in. deep, weighing 100 lb. per foot, having a section modulus of 198. Whenever a greater section modulus was required a riveted girder was necessary. Bethlehem beams range to a maximum size of 30 in. deep, weighing 200 lb. per foot, with a section modulus of 610, which is more than three times the strength of the largest beam previously rolled. The field for the use of rolled beams in place of riveted girders is thereby increased more than threefold.

Emphasis is laid upon the fact that as compared with riveted sections wide flange beams rolled on the Grey mill can be used for a variety of purposes with economy in weight, or with a saving in the cost of fabrication and in some cases both.

**The Dutability of Ground Corundum.**—A sharp controversy has arisen between certain importers of ground corundum and the customs officials over the question as to whether this product is entitled to free entry as "sand, crude or manufactured," or is liable to duty at the rate of 1 cent per pound by similitude to ground emery. In a decision by the United States Circuit Court for the district of Vermont, as noted in *The Iron Age* of August 8, corundum is held to be dutiable, but the importers have advised the department that an appeal will be taken to the Circuit Court of Appeals for the Second Circuit. If the state of the record in this case will permit the Government will endeavor in the Circuit Court of Appeals to put forth the alternative contention that if the similitude clause does not apply in this case corundum is not necessarily free of duty as sand, but is subject to the provision of section 6 of the tariff act, which levies a rate of 10 per cent ad valorem on "unenumerated unmanufactured articles" and of 20 per cent. on unenumerated manufactured articles."

## Charts from the Brown Speed Recorder.

In *The Iron Age*, April 4, 1906, a description was given of the new recording revolution indicator made by Edward Brown & Son, 311 Walnut street, Philadelphia, Pa. One of the principal uses of this instrument is the taking of a continuous record of the speed of blast furnace blowing engines, and in that work it is being found very useful.

The records from blowing engines herewith reproduced in reduced facsimile afford an interesting commentary on the existing conditions. Fig. 1 shows a chart from a recording revolution indicator connected with a blowing engine at an eastern Pennsylvania furnace. It will be noticed that the number of revolutions per minute fluctuates several revolutions at times. The hour or minute at which the engine has been slowed down or stopped is also clearly shown. Fig. 2, a record made at the Youngstown Steel Company, Youngstown, Ohio, shows an excellent condition of affairs, as the steam driven blast furnace blowing engine was kept at very closely constant speed, the speed seldom varying over a quarter of a revolution except when the engine was stopped.

A chart taken from an instrument used in connection with a gas driven blowing engine of a well-known type at the Park Gate Iron & Steel Company, Rotherham, Eng., is shown in Fig. 3. It is evident from this that the number of revolutions of a gas blowing engine is subject to very sudden and great fluctuations, a feature which

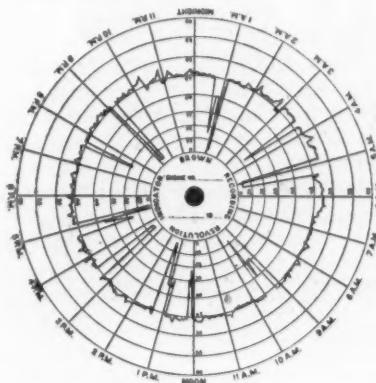


Fig. 1.

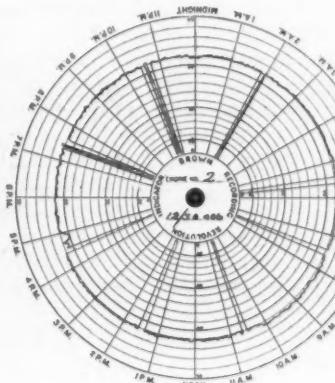


Fig. 2.

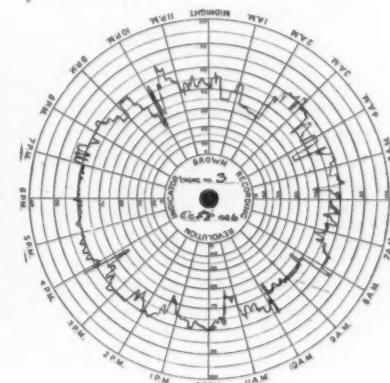


Fig. 3.

Charts from Brown Recording Revolution Indicators Connected with Blast Furnace Blowing Engines.

is not favorable in the operation of blast furnaces. According to the record illustrated a fluctuation of as much as 10 rev. per min. occurs at intervals of every few minutes, except for a space of several hours, during which time the speed did not vary a revolution. It is difficult to give a reason for such a peculiar record, unless the conditions in England are greatly different from those in this country.

The company makes recording revolution indicators with charts adapted to German requirements, and one of them is in use at a well-known German plant upon a gas blowing engine. It has been necessary to make some slight changes in the design of the instrument to suit the conditions in Germany, but this has not affected the successful use of the recorder.

The instrument, as explained in the issue containing its description, makes use of the action of centrifugal force. A body of mercury contained in a central chamber is thrown outward and upward into hollow revolving arms by an amount proportional to the speed at which the arms are revolved. A float resting on the mercury is connected to a pen arm, which traces a line on the chart, the latter being driven by clockwork. These instruments have heretofore been furnished with a chart 6½ in. in diameter, but are now being manufactured with an 8-in. chart, making it possible to use wider divisions. It is not to be construed from the foregoing that the instrument is only adapted to blast furnace engines, for its successful application is quite as possible to all kinds of engines, machines, dynamos and motors where a record of the revolutions or speed is desirable.

## Smooth-On Iron Cements.

The Smooth-On Mfg. Company, Jersey City, N. J., furnishes the following description of its products:

The chemical iron compound named Smooth-On was first made in 1893 by Vreeland Tompkins, a chemical student and graduate of Rutgers College. The object sought was a compound that could be easily applied to cracks and holes in iron to make permanent repairs. To fill this purpose satisfactorily, the compound must metalize practically as hard as iron. It must expand while metalizing, so as completely to fill any opening into which it is introduced and also force itself into the grain of the iron. When metalized it must expand and contract the same as iron. After two years of experimenting this was accomplished, and the compound was invented which forms the base or starting point for the different Smooth-On cements.

It was first prepared only in powder form and used by mixing with water to the consistency of stiff putty and immediately applied to cold metal. In a few hours it became as hard as the iron, with the same color and appearance and the same power of expansion and contraction. This cement, while very useful where small amounts were required, necessitated the hurrying of the work, when handling large quantities, to get through before the cement became too stiff. By further experiments a solvent was found that would evaporate upon the application of heat, and this has enabled Smooth-On to be prepared and kept in paste or fluid form, until wanted for

use. This greatly enlarged the use of the cement, as it may now be applied to hot or cold metal.

There are six Smooth-On preparations, each made for a special purpose, as follows: Smooth-On for foundrymen, the first Smooth-On iron cement made, for removing blemishes from iron or steel castings, and used for such purposes by the largest iron and steel manufacturing concerns throughout the world; compound for engineers, for making repairs on steam or hydraulic work, when the application can be made to cold metal; joints, for making joints on cast iron hub joint pipes; elastic cement, in fluid or paste form, for running into very small cracks, holes or seams; sheet packing, a combination of Smooth-on iron cement and rubber, which completely fills any uneven places in the flanged faces, making a perfect joint instantly; coated corrugated steel gaskets, made from specially prepared, mild, tough steel, stamped with concentric corrugations and then coated with Smooth-On elastic iron cement, joints thus made not being affected by steam, water, oil, air or ammonia.

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At a recent meeting of the Institution of Civil Engineers, of England, details were given of the speed and coal consumption of the turbine steamer *Virginian* of the Allan Line, running between Liverpool and Montreal. In a series of voyages it has averaged 17.2 to 17.65 knots at an estimated power of 12,700 i.h.p. The average coal consumption was 1.30 lb. per i.h.p. for the propelling machinery alone, 1.42 lb. including the auxiliary machinery, and 1.507 lb., including also the electric light machinery.

## The Goodman Electric Locomotive for Iron Mines.

Electric haulage of cars in iron mines imposes conditions somewhat different from those met in other classes of mining service. To meet these peculiar conditions a special iron mining locomotive has been developed by the Goodman Mfg. Company, Chicago, and Fig. 1 herewith shows the appearance of the machine as built to 24-in. track gauge.

In several ways the design and construction of this locomotive are unique. The main distinguishing feature is the use of a single motor, its armature lying lengthwise between the wheels and geared to both axles. Thus the four wheels are constrained to work together as a

nion in the frame, concentric with the center line of the motor armature. One-half of the weight of the locomotive is transmitted through this trunnion to the second pair of wheels. This permits independent movement of the four wheels to accommodate all irregularities of track surface. Such flexibility is of advantage, not only for maximum driving contact, but also in reduction of liability to derailment. Moreover, the equal distribution of weight to four wheels reduces to a minimum the pressure per unit of track length and thus relieves in a measure the severity of the service on the track itself.

The locomotive is symmetrical in design, built entirely within the breadth limits set by the track wheels themselves, and has the great preponderance of its weight concentrated between the axles. Thus the locomotive may be operated in the narrowest haulageways; it is

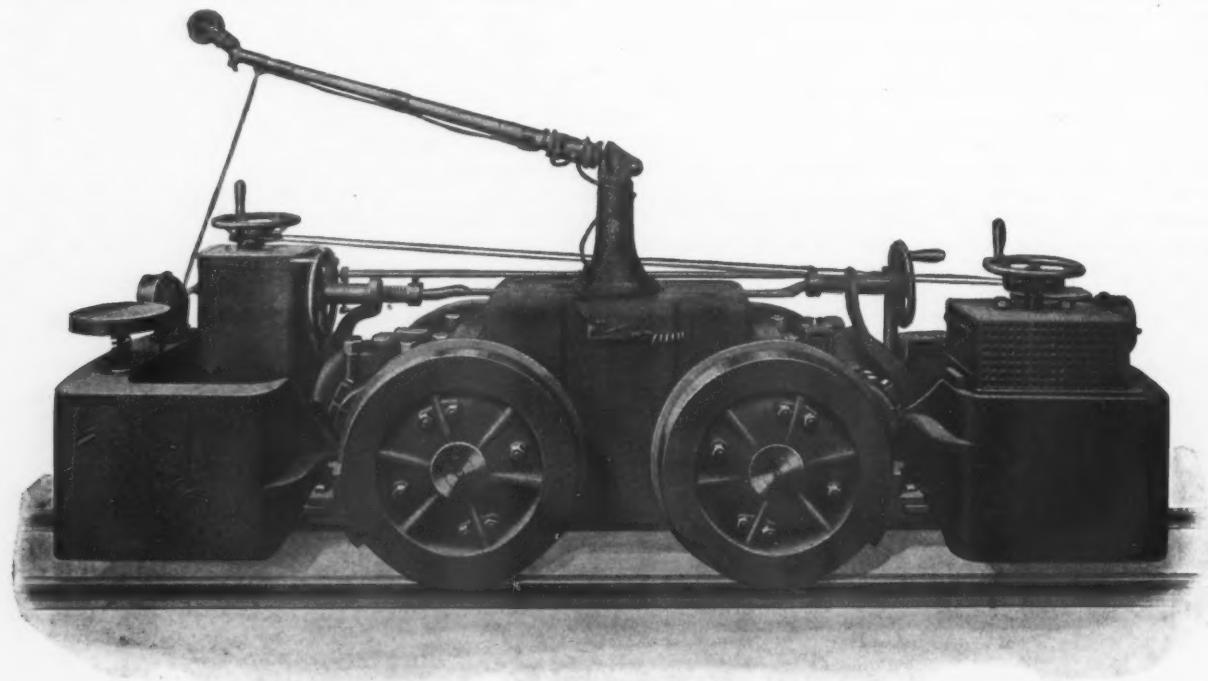


Fig. 1.—The Single-Motor Electric Locomotive for Iron Mining Service Built by the Goodman Mfg. Company, Chicago.

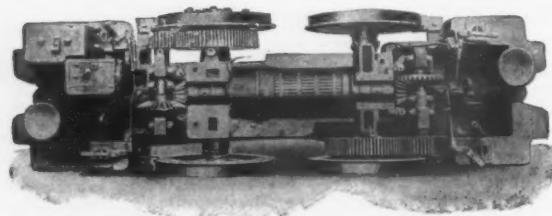


Fig. 2.—A Plan View of the Uncovered Working Parts.

unit of driving power. This arrangement gives greater starting and hauling power, due to the fact that no wheel can slip until they all slip—a desirable condition, impossible of attainment in locomotives which, like street cars, have the axles driven independently by separate motors.

Fig. 2 shows the arrangement of working parts in a locomotive of this type turned on its side. This view also illustrates the accessibility of the parts, which are uncovered, as indicated in this engraving, by simply lifting off the top magnet casting or motor shell, after removing the brake bar and gear cases.

Another feature of importance in a locomotive designed to operate on tracks roughly laid and of comparatively temporary character is the provision of flexible wheel base, such that there may be an equal distribution of track-wheel pressure for good driving contact at all times. Flexibility in this locomotive is secured by an application of the three-point principle of suspension. Two points are two of the wheels, their axles turning in fixed bearings on the locomotive frame; the third point is a trunnion

much easier to get around and safer for men to pass than is a locomotive of greater width. The wheels, being at the outside, facilitate replacing on the track in case of derailment, this work being done with the ordinary wrecking frogs and the locomotive's own power, and also the brake-shoes are more accessible and, therefore, very easily and quickly renewed.

The design of this locomotive makes it admirably adapted to double-end control, the motor being carried between the two axles and occupying no space beyond them. Double-end control has a number of substantial advantages. The motorman, since he can always keep a position between the locomotive and the trip, is within easy reach of the coupling pin between the locomotive and the first car, so that he may do at least a portion of the switching. The motorman faces always ahead and does not have to twist around in his seat to observe the track before him. The trolley pole, located midway between the axles, brings the trolley wheel and rope always within easy reach of the motorman, who can, therefore, prevent the trolley wheel from leaving the wire in many cases when it otherwise would when beyond his reach half the time on a single-end locomotive. Under such circumstances the motorman may operate with greater confidence and run at higher speed.

All parts being accessible from above, no pit is required in the motor house, and all work on the locomotive is done in good light and to best advantage. The wiring from end to end is placed in a special duct provided in the main frame casting, sealed in with insulating compound and protected by a steel cover.

Simplicity is a notable characteristic of the construction. Since there is only one motor, there is only one

armature, with two field coils and two sets of brush holders. These few parts are all large and substantial, because the motor is large, providing power, as it does, for the entire locomotive. Under the conditions of operation in mines there are very important advantages in a machine which consists of a small number of large parts as opposed to one having a greater number of parts relatively small. The more simple construction minimizes the expense of maintenance and increases the reliability. The longitudinal position of the armature gives plenty of room, even on narrow-gauge tracks, for parts of generous dimensions, thus permitting the use of a broad commutator, long armature journals, ample axle bearings, and wide-face driving gears. The construction also makes it practical to bolt the spur gears directly to the driving wheels, thus reducing the torsional strains on the axles as compared to the construction wherein the gears are keyed to the axles themselves.

No sanding of tracks being required in an iron mine where the rails are constantly sprinkled with ore, sand boxes are not provided on this locomotive, and this omission gives increased room for the motorman in the cabs.

Special provisions are made for protection of working parts against the cutting action of the ore; the gears are fully incased and the bearings are fitted with dust caps.

Radial or swinging drawbars are provided, so as to facilitate going around curves of short radii without the danger of cramping or derailment. The locomotive illustrated is one of four furnished during the past few months to the Oliver Iron Mining Company for use at Ely, Minn. The track gauge is 24 in., the height 40 in., the extreme breadth 36 in., the wheel base 38 in. and the wheels themselves 28 in. in diameter. The weight of the locomotive is 6½ tons and the motor is of 60 hp.

#### First Half Year's Production of Denatured Alcohol.

WASHINGTON, D. C., August 13, 1907.—The report of the Internal Revenue Bureau for the first half of the calendar year 1907, which has just been compiled, shows a production of 1,774,272.25 gal. of denatured alcohol for the first six months under the new free alcohol law, which went into force January 1 last. These figures foreshadow a consumption for the calendar year in excess of 3,500,000 gal., and there is reason to believe that the stimulus given to the production and consumption of denatured spirits by the supplemental free alcohol law and regulations thereunder recently issued will carry the year's production well beyond 4,000,000 gal.

The output of June was unexpectedly large, showing a gain of about 48,000 gal. over May. Inasmuch as many dealers and manufacturers had decided to defer handling or using denatured spirits until the taking effect of the new statute it was anticipated that June would show a decline, but it is now apparent that the stocks of denaturers and distillers made up during the early part of the year have been so depleted that an increased rate of production is necessary to keep up with the demand. The total production of completely denatured alcohol in June was 138,856.71 gal., and of specially denatured, \$0,965.02 gal.

The enactment of the free alcohol law has conferred important benefits upon consumers, which are not to be measured by the consumption as indicated in the above figures. The passage of the law immediately operated to reduce the cost of wood alcohol from 60 to 30 cents per gallon, a reduction which deterred many manufacturers who anticipated using denatured grain spirits from abandoning the use of wood alcohol. These manufacturers while not now employing denatured alcohol have nevertheless greatly benefited by the passage of the alcohol law. It is also believed that the exploitation of denatured spirits as a substitute for gasoline, kerosene and other petroleum products has already operated as a check on the upward tendency of the prices of those products, and will have an even greater influence in the future.

W. L. C.

#### Cast Iron Pipe Figures.

The United States Cast Iron Pipe & Foundry Company recently made a statement to the New York Stock Exchange from which the following extracts are taken:

The company was incorporated under the laws of New Jersey on March 2, 1899. Authorized capital stock is \$30,000,000, consisting of \$15,000,000 noncumulative 7 per cent. preferred stock and \$15,000,000 common stock. In the event of the dissolution of the corporation the holders of the preferred stock are entitled to receive the par value of their preferred shares out of the surplus funds of the corporation before any payment shall be made therefrom to the holders of the common stock.

The company is the result of a purchase of the companies owning plants engaged in the pipe business, as shown below:

Companies and location.	Acreage.	Capacity in tons.
Addyston Pipe & Steel Company, Addyston, Ohio.....	160 acres, 6 lots	60,000
American Pipe & Foundry Company, Anniston, Ala.....	110 acres.	36,000
American Pipe & Foundry Company, Bessemer, Ala.....	164 acres.	50,000
American Pipe & Foundry Company, Bridgeport, Ala.....	40 acres.	18,000
Buffalo Pipe & Foundry Company, Buffalo, N. Y.....	13 acres, in city.	25,000
McNeal Pipe & Foundry Company, Burlington, N. J.....	225 acres.	60,000
American Pipe & Foundry Company, Chattanooga, Tenn.....	38 acres.	36,000
Lake Shore Foundry Company, Cleveland, Ohio.....	11½ acres, in city.	36,000
Ohio Pipe Company, Columbus, Ohio..	11½ acres, in city.	20,000
Dennis Long & Co., Louisville, Ky...	11½ acres, in city.	50,000
Addyston Pipe & Steel Company, New- port, Ky.....	22 lots.	20,000
American Pipe & Foundry Company, South Pittsburg, Tenn.....	16 acres.	25,000
National Foundry & Pipe Works, Scott- dale, Pa.....	50 acres.	60,000
Wisconsin Steel Company, West Super- rior, Wis.....	135 acres.	18,000
Total annual capacity in tons.....		514,000
Wisconsin Steel Company, West Superior, Wis.....		Steel plant.
National Foundry & Pipe Works, Scottdale, Pa.....		Blast furnace.

All are amply provided with railroad connections. The plant at Burlington, N. J., has tidewater connections and that at West Superior has lake connections. All the machinery, tools and equipment originally at the Bridgeport, South Pittsburg and Newport plants that could be utilized have been removed to other plants located more advantageously, whose capacity has thus been increased and the costs of manufacture reduced. The property at Bridgeport, Ala., has recently been sold.

The properties are all now owned in fee by the company, and are free from any encumbrance except the balance that is due on bonds issued by the American Pipe & Foundry Company, consisting of 6 per cent. bonds of \$1000 each, amounting to \$1,500,000, dated July 1, 1898, and due July 1, 1928. Of these bonds the company holds in its treasury \$431,000, which have been purchased for the purpose of turning over to the sinking fund in accordance with the requirements of that fund. There is now in the sinking fund \$162,000 bonds, leaving outstanding \$907,000. The company is not liable for any leases or special agreements. Following is a statement of the sums expended for repairs and replacements and also for improvements:

Year ending	Tool repairs.	Repairs to ma- chinery and equipment.	Additions and improvements.	Totals.
May 31.	\$81,515	\$182,616	\$53,572	\$317,702
1900.....	110,784	180,150	89,535	380,470
1901.....	170,246	211,166	117,287	498,699
1902.....	145,179	184,736	105,836	435,751
1903.....	175,303	206,986	40,139	422,428
1904.....	193,240	249,750	142,914	585,904
1905.....	184,563	263,145	262,149	709,857
1906.....	167,805	263,449	585,438	1,016,692
Totals.....	\$1,228,635	\$1,741,998	\$1,396,870	\$4,367,503

\* Eleven months ending May 1.

These expenditures have been charged to the operating expenses of the company and have never gone to augment the cost of properties or plants.

## Nyflexmet Expansion Joints.

The usual provisions for expansion in a line of steam piping are bends, either solid or made up with elbows, or slip joints made on the ordinary stuffing box principle. A type of joint which is claimed to be an improvement on the older forms, and without their limitations, is now offered by the New York Flexible Metallic Hose & Tubing Company, 173 Lafayette street, New York, known as the Nyflexmet compensator. It accomplishes its purpose in much the same way as a U or S bend, but with more effectiveness in the same space, as the relatively stiff legs of ordinary pipe bends are replaced with flexible pipe. While this joint is new in America, it has been successfully used in Europe for some time.



Fig. 1.—Cross Section, Showing the Hose Construction.

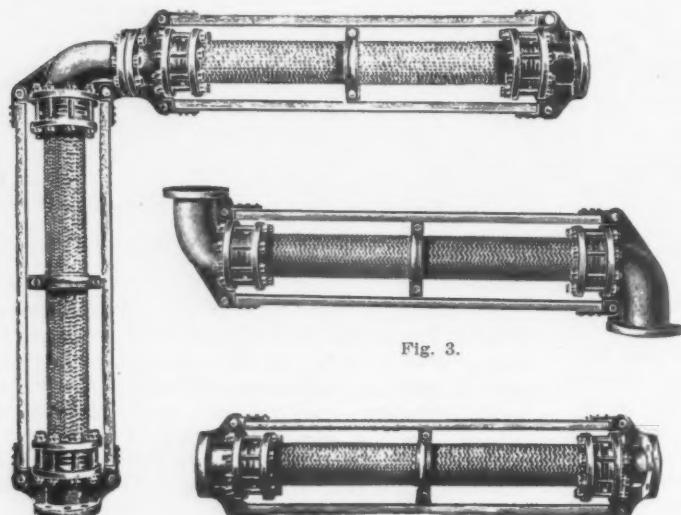


Fig. 2.

Fig. 3.

Fig. 4.

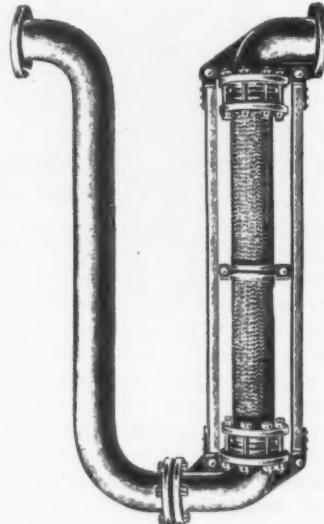


Fig. 5.

Various Forms of Expansion Joints Made by the New York Flexible Metallic Hose & Tubing Company.

At some suitable place the continuity of the line is broken by an offset, in which is inserted strong flexible metallic hose, forming a pressure-tight union with each pipe, and yet in no way obstructing their movement endwise. The hose for these joints is made of steel or copper ribbons spirally wound, with interlocking edges, as shown in Fig. 1. Asbestos packing under the edge lips insures tightness, and the natural strength of the metal wall is enhanced by a single or double sheathing of woven, flat, pressed steel wires, conformed to the surface by special braiding machinery.

Special cast flanged connectors join the main pipe line and the flexible piece. They are suitably packed and united by through bolts, which not only set out the packing ring, but also insure proper hold of the connector casting on the steel-woven sheathing of the hose section by means of a suitable internal taper in the casting which firmly grips the sheathing. It is impossible for any pressure to pull the connectors off the hose, as they are screwed in so firmly that the hose would first burst. No thread need be cut in the hose for this screwed connection, as its spiral construction produces naturally a continuous thread, admirably adapted for making secure joints.

Expansion is not the only linear distortion to which pipe lines are subject, so that the term "expansion joint" is not so accurate or so generally applicable as "compensator" would be. Wherever a pressure-carrying line must be run between points, the distance between which is subject to variation, there must be some provision to compensate for such change of length. Such instances are of frequent occurrence, as in connecting up portable boilers to engines, in running lines of piping on docks subject to heavy jars, in temporary steam and compressed air lines used in building and in engineering operations. In such cases the Nyflexmet expansion joints or compensators, it is claimed, materially increase the safety of the plant, particularly where the requirements are very severe in regard to pressure and heat.

The construction of the joints is modified in different cases to adapt them to the conditions obtaining. It is possible to make any naturally-occurring bends or branches in the line of pipe useful in allowing for expansion and contraction. For instance, where a line turns at a right angle a double expansion joint of flexible metallic hose, such as shown in Fig. 2, may be inserted, and avoids the necessity of introducing bends not otherwise requisite, such as spring elbows.

For straight lines of piping, Z-shaped expansion joints (Fig. 3) are provided, as well as U-shaped joints (Fig. 5), equipped with one or two flexible hose legs. The latter must be inserted in the middle of the run of piping in order to obtain the complete benefit of the compensating capacity of both hose legs. Single I-shaped expan-

sion joints (Fig. 4) are inserted when the line of piping must be connected with a second line running at right angles to it. Fig. 6 shows a typical installation of an I-shaped compensator with elbow in a high-pressure steam line.

These lengths of hose are not inserted in the line without due provision for limiting the distortions and stresses to which they could possibly be exposed. From the illustrations it will be seen that rods are disposed at either side, passing through and connecting with a pipe clip secured to the hose leg at mid-length. The combination forms the so-called "limiting parallelogram," which prevents straining of the hose by distributing uniformly throughout its length any bending stresses to which it may be subjected, causing it to bend S-wise. Owing to this provision for limiting distorting stresses, and owing to the ability of the hose to resist pressure up to 900 lbs. and more for pipes up to 8 in. internal diameter, this form of expansion joint insures safety under all pressures occurring in practice. Any leaks developing in course of time are of little importance at first, and increase slowly, allowing abundant time for repairs and not requiring an immediate shutdown.

For low-pressure installations the construction is

modified; metal hose without woven-wire sheathing may be used, and the flange connections may be cast to the hose by means of white metal.

Every stress which could exert harmful effect on the pipe line is removed with these joints, because the movements of the metal hose are easy and take place without appreciable resistance. The capacity for taking up longitudinal displacements of the pipe line is practically unlimited, the amount depending only on the length of hose section used. Metal hose expansion joints are in operation which are capable of allowing for a linear expansion of  $3\frac{1}{2}$  in., so that one of these joints accomplishes the same result as a number of spring bends.

The joint is easily repaired, as it is never necessary to

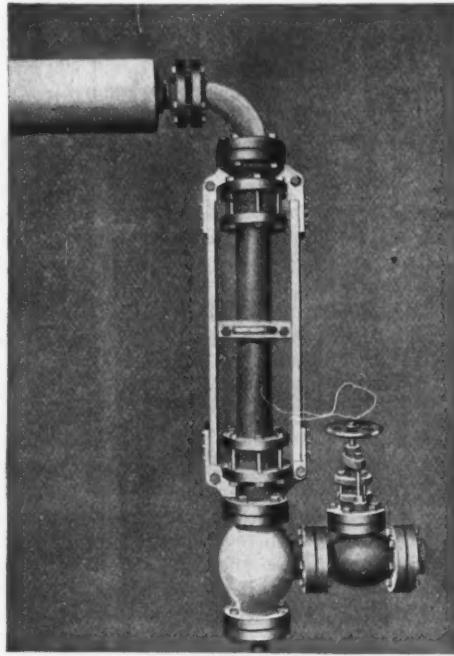


Fig. 6.—An I-Shaped Nyflexmet Compensator in a Steam Supply Pipe.

renew the entire joint; at the most, one or two easily connected parts have to be inserted.

#### The Production of Asbestos in 1906.

WASHINGTON, D. C., August 13, 1907.—The production of asbestos in the United States in 1906 declined nearly one-half, according to the annual report of the U. S. Geological Survey, which has been compiled by J. S. Diller. The output was 1695 net tons, valued at \$28,565, as compared with 3109 tons, valued at \$42,975, in 1905, and 1480 tons, valued at \$25,740, in 1904. Approximately 1540 tons came from Georgia, Virginia and Massachusetts, and is fibrous and amphibole. The remainder, from Wyoming and Arizona, is chrysotile, as is probably also that of California.

#### Two Types of the Product.

Commercial asbestos includes fibrous minerals of two distinct types. The true asbestos is actinolite or tremolite and belongs to the amphibole group, and with it may be placed the other fibrous amphiboles, anthophyllite and crocidolite. The more important asbestiform mineral, however, is the fibrous variety of serpentine known as chrysotile. Both fibrous amphibole and chrysotile possess qualities which peculiarly fit these minerals for use in the arts. The term asbestos, meaning noncombustible, thus has come to stand for mineral fiber which is more or less resistant to both heat and acids. Although the chrysotile, by reason of its chemical composition, may be more affected by very high temperature and strong acids than the amphibole, the greater strength and flexibility of the chrysotile fiber make it the more valuable of the two. Thus, while mineralogically the amphibole variety is the true asbestos, the chrysotile is the standard asbestos of the trade.

#### Imports.

The following table shows the annual value of imports of asbestos into the United States during the past four years, principally from Canada:

Year.	Imports.		Totals.
	Unmanufactured.	Manufactured.	
1903.....	\$657,269	\$32,058	\$689,327
1904.....	700,572	51,290	751,862
1905.....	776,362	70,117	846,479
1906.....	1,010,454	65,716	1,076,170

It is stated on good authority that "those familiar with the asbestos market are aware that the present supply of asbestos is not sufficient to meet the world's demand. This is principally due to the increasing uses and applications of the mineral for industrial purposes. It may be affirmed that the output of all the existing asbestos mines is insufficient to supply two-thirds of the demand for this product, and the leading manufacturing firms interested in the industry are diligently searching for new deposits."

The production of asbestos in Canada in 1906, wholly chrysotile, is reported at 59,283 net tons, valued at \$1,970,878, as against 50,670 tons, valued at \$1,486,359, in 1905. The production of asbestos in 1906 was 20,127 tons, valued at \$17,230, as against 17,594 tons, valued at \$16,900, in 1905. Asbestite is the rock which has been reduced to sand in the mill, contains some asbestos, and is used extensively for fireproof wall plaster.

The average price per ton of sales reported in 1906 is \$16.86. This represents an increase of \$3.04 per ton over the average price for 1905. The lowest price for actinolite was \$8 per ton; the lowest price for amphibole asbestos was \$17.61, and the highest price for chrysotile was \$30, though some as yet unsold was estimated at \$150 per ton.

The Canadian production of asbestos in 1906 was valued at an average of \$33.25 per ton, an advance of 23 per cent. on the average price for 1905. Of this product, one-fifteenth was valued at \$165 per ton. The production of asbestite from the Canadian mines in 1906 was valued at 85 cents per ton.

These prices afford data in estimating the value of asbestos deposits, but of greater importance is the relative proportion of asbestos in the rock mine. An average of from 30 to 60 per cent. of all the rock mined is suitable for milling. In the majority of the mills an extraction of fiber amounting from 6 to 10 per cent. of the milling rock is effected. The quantity of the higher grade crude asbestos usually secured by hand cobbing in the richest mines is from 1 to 2 per cent., although one or two mines produce a somewhat higher percentage. In a typical mine the asbestos produced amounted to 6 per cent. of the rock mined, at a cost of over \$17 per ton of product for labor, power and supplies.

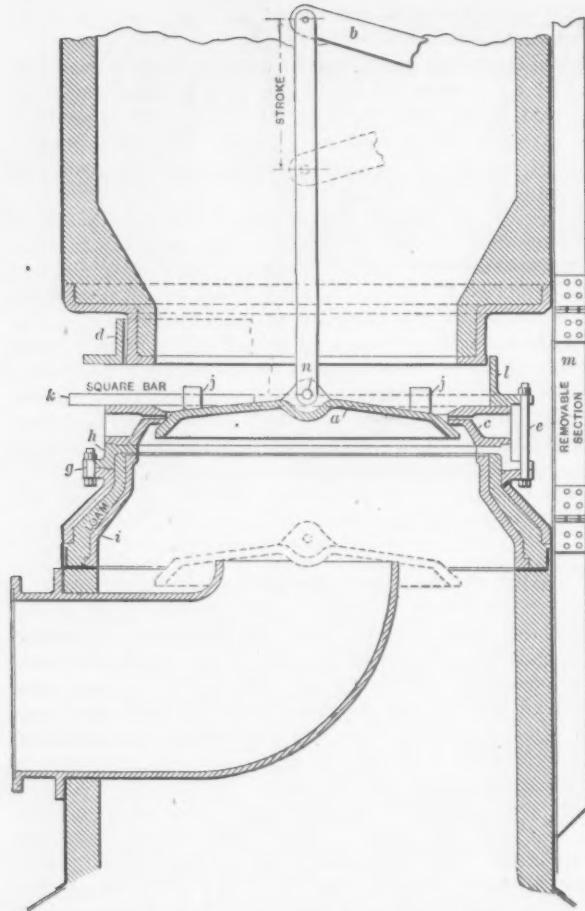
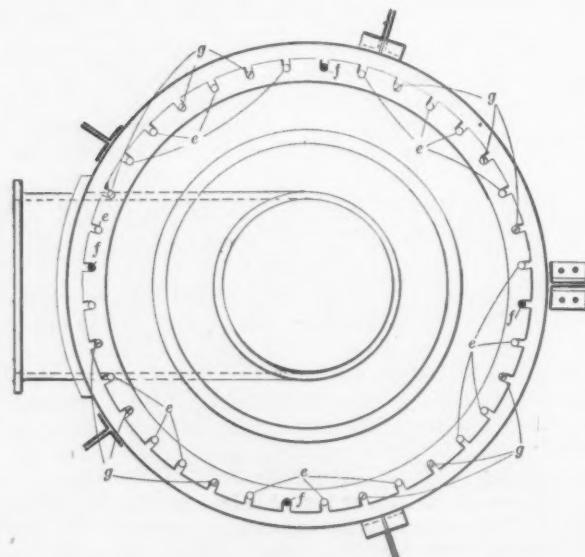
W. L. C.

**Similar Goods Must Take the Same Freight Rate.**—The Stowe-Fuller Company, manufacturer of brick, Cleveland, Ohio, on appeal to the Interstate Commerce Commission, has secured an order directing several railroad companies to desist from making different rates for the transportation of fire brick, building brick and paving brick, all made from fire clay and of the ordinary 9-in. size known to commerce. It has been the custom to make one rate for fire brick, another for building brick and a third for paving brick, even if they were all made of the same material and coming from the same kiln. The commission states that classification must be based upon a real distinction from the transportation standpoint and that to hold otherwise would be to promote false billing on the part of shippers. It is believed that this ruling will affect the rates on many other materials, all of which can be carried by railroad companies for the same cost and which therefore can be put in the same classification for freight charges.

The figures given by the Census and Statistics Department of the Dominion Government, showing that Canada's population on April 1, 1907, was 6,504,900, represent an increase of 1,133,586, or more than 21 per cent., in six years. The United States has contributed no small part of this increase.

### The Rust Chimney Valve for Three-Pass Hot Blast Stoves.

To change a valve or seat in the ordinary chimney valve for hot blast stoves it is necessary to allow the stove to cool off for from three to four days, so that a man may enter inside the chimney. After the stove has been cooled



A Chimney Valve for Hot Blast Stoves, Invented by W. F. Rust, Pittsburgh, Pa.

a block and fall is placed in the top of the chimney, and the valve and seat, which weigh about 1000 lb. each, are removed separately. The bolts for holding the seat to the subseat are removable only from the inside of the chimney, and it is necessary that the nut on each bolt be taken off before either the valve or seat can be removed. It is not possible to do any of the work until the stove has been cooled. In marked contrast is the hot blast stove chimney valve, the construction of which is illustrated,

invented by W. F. Rust, assistant engineer of the American Sheet & Tin Plate Company, Pittsburgh, Pa. In this valve a valve or seat may be changed without shutting off gas more than a few minutes, since all work is done from the outside, and the whole operation should be completed in a quarter of an hour.

Referring to the accompanying engraving, the valve *a* is hung in the usual way from a lever, *b*, which is operated from the ground by means of a cable. The seat *c* is of a form and is so arranged as to be air cooled. A steel ring *l* (made in halves if desired) holds the seat *c* to the subseat, the clamping being done by means of extra heavy bolts *e*. In addition to the bolts *e* (about 20 in number in the illustration) there are four long bolts, *f*, for raising ring *l* to the position *d*, when the valve is being removed, and about 12 short bolts, *g*, which keep the joint between the subseat *h* and the casting beneath from being broken while the valve *a* and the seat *c* are being removed. Casting *i* is made in segments and is intended to take the place of brickwork, which, if it is not rapidly cut away by the large volume of air wearing against it, is knocked out by jarring of the valve against the seat when the cold blast is turned on before the valve has been properly closed. The valve *a* is provided with two eyes, *j*, for receiving the square bars *k*.

To change a valve or seat, all of the bolts *e* are removed before the stove is taken off gas. By using the four bolts *f* as jacks the clamping ring *l* is lifted into the position shown by *d*, which is a part of the same ring. The valve is then closed and the two bars *k* are driven through the eyes *j*, above the valve seat. The eye bolt *n* is then removed through the opening above the valve seat or through a small door immediately above the valve. After removing the angles *m* the valve and seat are free to be slid on skids, and a new valve and seat may then be put in place. The whole operation should not take over 15 minutes, whereas, with the old style valve the time required is from one-half to one day, and it is hot work.

With the Rust valve all the bolts are outside, where they are accessible and are not affected by expansion. The design is such that slotted holes can be used throughout. This is not possible with the old design. The bolts can be extra heavy, so there is no danger of the slamming of the valve against the seat breaking the joint. The chimney is held in place by angle iron supports and guys are not necessary.

The valves may be manufactured on a royalty basis. The Joliet plant of the Illinois Steel Company has some of these valves in use. However, since these were put in, about a year ago, several improvements have been added, so that the valve illustrated is somewhat different.

The Milwaukee School of Trades has, by a special act of the Wisconsin State Legislature, become a part of the Milwaukee public school system and will in the future be maintained at public expense. The school was organized two years ago and has been supported by public spirited manufacturers. Frederick W. Sivyer, president of the Northwestern Malleable Iron Company, was one of the leading spirits in organizing the school and was its president. By the new law the property is turned over to the city and an advisory committee of business men is named to act with the school board in its management and control. The School of Trades has been splendidly conducted, maintaining several departments, including machine work, pattern making and plumbing, and has been under the special direction of Professor Perry and several assistant instructors. The advisory board, just appointed, consists of five members, three of whom are leading manufacturers and have been closely identified with the school since its incorporation, as follows: Frederick W. Sivyer, for three years; A. J. Lindemann of the Lindemann & Hoverson Company, for two years, and T. J. Neacy of the Filer & Stowell Company, for one year.

Large risers, the *Brass World* says, are absolutely necessary for successfully casting manganese bronze. Small risers are a detriment in drawing metal from the casting rather than feeding it.

### A New National Vacuum Pump.

A vacuum pump of special design, claimed to possess many advantages over familiar styles for its class of service, has been placed on the market by the National Steam Pump Company, Upper Sandusky, Ohio. Under a test a 28-in. vacuum was maintained while working under severe conditions with no special provision to prevent leakage in the suction pipe. Fig. 1 is an exterior view of the pump and Fig. 2 a vertical longitudinal section.

The air cylinder is built along lines that reduce the valve chamber and clearance at the heads. It is fitted with a hard tempered brass lining, insuring long wear, but which can be easily replaced when necessary, at small expense. The valves are of brass, and the valve seats are of composition metal inserted with a driving fit. The arrangement is such that the suction seat can be taken out through the discharge valve opening, and access to both valves is obtained through small hand plates at the top of the cylinder casting. The reseating of both

feature. This is accomplished without the use of port plugs, allowing a perfectly free exhaust. The valve gear is of the rocker arm pattern, having steel roller bearings, which affords positive valve motion, and has been used successfully on the company's regular line of pumps.

The advantages claimed for this pump over the ordinary pattern are higher vacuum, less clearance, greater durability, smaller floor space, smaller cost of maintenance, lighter weight and less expensive foundation. The 6 x 8 x 12 in. pump has the following overall dimensions: Length, 70 in.; width, 12 in.; height, 20 in.; weight, 625 lb. Other sizes are in proportion and are as follows: 4½ x 5 x 10, 4½ x 6 x 10, 5 x 6 x 10, 5 x 7 x 10, 5 x 8 x 12, and 6 x 8 x 12 in.

It will be noticed that the smaller pumps have extra long stroke, which tends to give the best service with the least wear to the working parts.

On August 6 the last of the thin partition separating the two sections of the south tube of the Belmont tunnel,

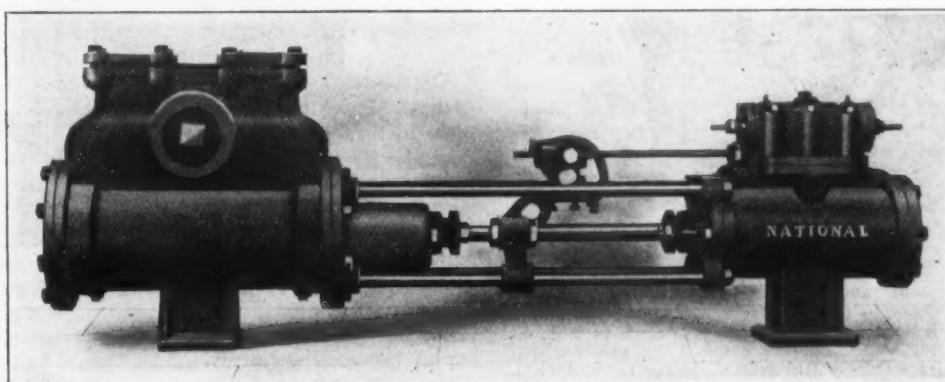


Fig. 1.—A Vacuum Pump of Special Design Built by the National Steam Pump Company, Upper Sandusky, Ohio.

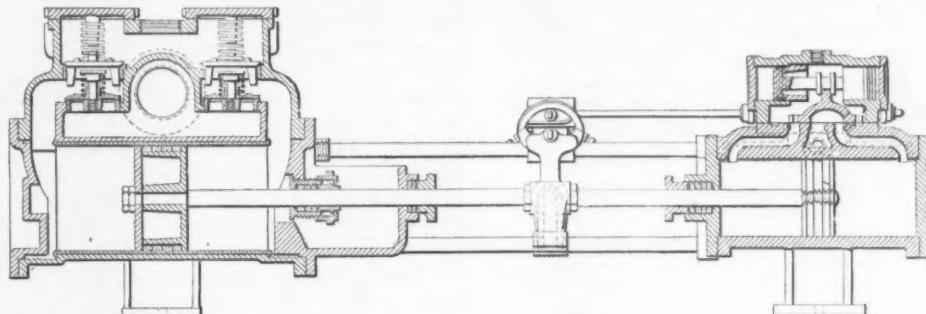


Fig. 2.—Longitudinal Vertical Section of the New National Vacuum Pump.

suction and discharge valves may be accomplished without disturbing any of the piping. The suction valves are regulated in the amount of their lift and guided by central stems of aluminum bronze. The discharge valves are of special design and are self-guiding, so that it is impossible for them to stick or hang up. Their lift is limited by stems extending down from the hand plates above, which also act as retainers for the springs. By this arrangement it has been possible to eliminate the customary discharge valve plate, thus reducing the number of gaskets and overcoming the trouble usually experienced from this source. The suction valves are of the regular flat faced type, but the discharge valves, being subject to the greatest pressure, are fitted to bevel seats.

The inside head of the vacuum cylinder is provided with a simple and effective water seal stuffing box preventing leakage around the piston rod. The sectional rod permits the removal of either cylinder for repairs without disturbing the pipes on the opposite end. Tobin bronze is used for that part of the rod coming in contact with liquid and steel for the part in the steam end.

The steam cylinder is of the standard type made by this company, having both main and auxiliary slide valves, special attention being given to the cushioning

connecting Manhattan with Long Island under Forty-second street and the East River, was removed. Two days later the engineers made the first trip from shore to shore. Two months ago the north tube was completed. Digging began a little less than two years ago. By October 1 it is expected the tunnel will be ready for cars. This is a trolley tunnel.

The Chapman Valve Mfg. Company, Wm. V. Threlfall, general manager, Indian Orchard, Mass., has combined its St. Louis storerooms and offices and located at 16 South Twelfth street, where a very largely increased stock of valves will be carried. The company has within the past year doubled the capacity of its factory. It now claims to have by far the largest plant devoted exclusively to the manufacturing of valves.

For the third consecutive fiscal year the number of immigrants admitted to the United States exceeded 1,000,000 in the year ending June 30, 1907. The total was 1,285,349, against 1,100,735 in 1906, 1,026,499 in 1905, and 812,870 in 1904. For the past 10 years, or since the depression of 1893-1897, the total has been 7,208,746.

## The Treatment of Boiler Feed.

### With Special Reference to the Blackburn-Smith Feed Water Filter.

BY A. EUGENE MICHEL.

Water from nearly all natural sources contains besides chemically combined ingredients finely divided particles of clay, sand and organic matter held in mechanical suspension, all of which work havoc in a boiler. Some sand and other sediment will fall to the bottom in settling tanks, but clay and other finely divided matter remain in mechanical suspension, and if admitted to the



Fig. 1.—The Blackburn-Smith Feed Water Filter and Grease Extractor.

boiler bake on its surface and retard heat transmission. Organic matter contained in sewage or in the water from swamps, peat bogs, &c., often becomes highly corrosive on heating, and internal corrosion is the most destructive influence to which boilers are subjected. Wherever it is discovered the feed water should be purified. Organic substances also cause foaming, which conceals the exact water level, and may, therefore, lead to the burning of tubes and plates, or may cause the boilers to prime and the engine to be wrecked by water carried into the cylinder.

large tanks for the water supply that occupy space, which in crowded plants or on shipboard can be used to better advantage. All this heat and water may be utilized, the boilers may be protected from the entrance of oil and it is possible to dispense with clumsy tanks for feed water by the use of an effective filter or grease extractor

#### Methods of Treating Feed Water.

The methods of treating oil and scale forming elements chemically combined with the feed water may be roughly divided into two classes, internal and external—that is, inside the boiler and outside of the boiler. The internal method is to introduce periodically some chemical to neutralize the acids or change the chemical composition of the scale forming material, making a precipitate, which may be scraped or blown out. Of this

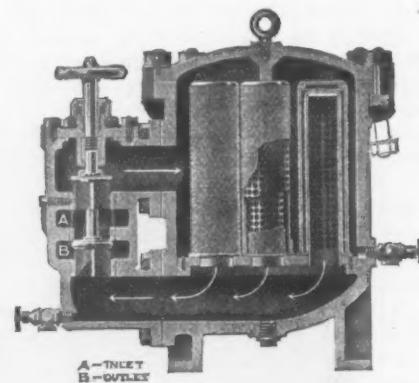


Fig. 2.—Cross Section of the Filter, Showing the Course of the Water.

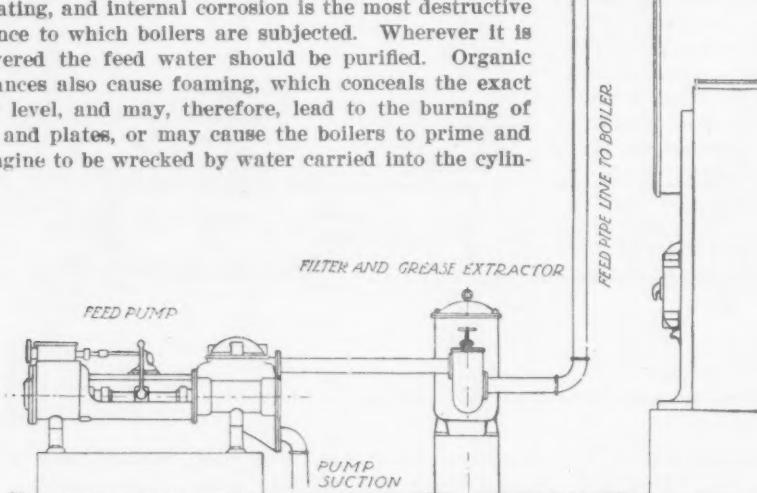


Fig. 3.—Typical Manner of Installing the Filter in a Stationary Plant.

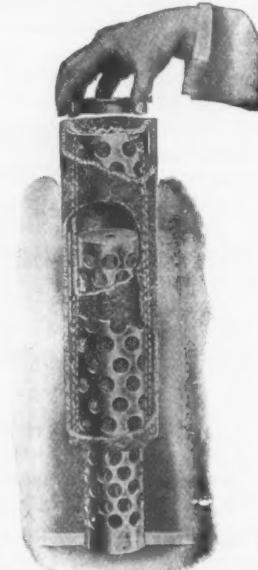


Fig. 4.—Replacing the Filtering Cloth.

matter held in mechanical suspension should always be filtered out.

#### Condensed Water from Heating Systems and Condensers.

The distilled water obtained from surface condensers or the returns of steam heating systems makes ideal feed water when it does not contain grease or dirt. Scale containing grease is not only detrimental to efficiency and difficult to remove, but, accumulating on parts exposed to heat, may cause the plates to overheat, weaken and bag and tubes to burn out. This is one of the most prolific causes of boiler explosions. A coating of oil will also conceal a cracked plate or defective rivet, all of which invite disaster. Exhaust steam contains from 90 to 95 per cent. of the heat originally present in live steam, and if not utilized this water and heat goes to waste. This means a low plant efficiency, and where water is expensive adds enormously to the cost of operation. Wasting the exhaust also often necessitates

practice Prof. William Kent says in his "Steam Boiler Economy":

"The treatment of feed waters inside the boiler has been a practice of many years' standing, but in the light of recent progress is not to be commended. A boiler certainly has all it can reasonably be expected to do when it is generating steam without being called upon to perform the functions of a chemical laboratory. The external method of treating feed water, chemically or mechanically, is being adopted by many progressive plants in this country, but in this the Americans are far behind the English, French, Germans, Belgians and Austrians, in whose countries the external treatment has been largely and most successfully practiced for many years."

Feed water may be purified outside of the boiler by settling, filtering, heating and chemical treatment. The latter two methods render certain elements insoluble, so that they are precipitated, after which they may be re-

moved from the water by settling and filtration. Settling of the sedimentation can remove only the mud and sand which have been carried along by the current, and is effective only with very large tanks and is slow. It is therefore impracticable in large plants, as the size of the tanks would be prohibitive.

If mud, sand and the organic matter contained in the feed water are to be removed rapidly to furnish large quantities of water, some kind of filtration is essential. One process uses tanks with perforated false bottoms, on which are placed coke, gravel, charcoal, hay or burlap, or a combination of these, through which the water passes into a chamber and is withdrawn by the feed pumps. The only head of water available to force the water through the filter bed is that due to gravity, the percolation is therefore very slow, and as the filter becomes clogged, ceases altogether. As the openings for the passage of water are necessarily large to obviate interference with the flow these filters are imperfect in their action. The principal difficulty, however, is the frequent renewing of the filtering material. The filter beds are so large that changing the materials is arduous and to be attempted only when the plant is shut down; as a result the filters are often clogged up and out of service.

#### The Removal of Oil from Condensation.

The ordinary separator, removing the oil by centrifugal force, dashing it against baffles, &c., would be ideal but for certain disadvantages, the greatest of which is that it may not remove all the oil. A separator in the exhaust pipe adds back pressure on the engine, and must be bulky to handle freely the heavy flow in large mains. Condensation of steam also occurs during separation, and feed water is lost with the oil unless a further separation is effected.

The surest way is to extract the oil from the water by passing the latter through filtering material in the line between the feed pump and the boiler. Linen terry is generally considered the best obtainable filtering material, and has come into extended use in this country and abroad, both in stationary and in marine plants. It is used on warships of the American, British, German and other navies and on many merchant vessels. A typical feed water filter and grease extractor which occupies small space and subjects all water passed to double filtration through layers of terry is the Blackburn-Smith filter, made by James Beggs & Co., 109 Liberty street, New York. It removes the oil from condensation, prevents foreign matter from passing, does away with the inconvenience of filtering tanks and is inexpensive to maintain. The double layer of terry through which all water must pass is easily removable and may be cleaned and used many times. The filter is placed preferably between the pump and boiler, as indicated in Fig. 3, so that pressure may be had to force the water through. Where a closed heater is used the water should pass through the filter first to remove the matter in suspension that, adhering to the surfaces of the heater, would impair its heat transmitting properties. Where a very large quantity of water is to be filtered a battery of filters is advantageous, any one or all of which may be placed in service or cut out at will. By having two filters one may be by-passed and cleaned while the other is in action.

Fig. 1 is a general view and Fig. 2 a cross section of the filter, indicating the course of the water. Entering the inlet it passes into the upper or filtering chamber, through the filtering cartridges, into the bottom chamber and thence through the outlet. Initially the water passes easily through the cartridges, but in time, as the foreign matter accumulates on the filtering material, some resistance results, and is indicated by the difference in the reading of pressure gauges connected to the filtering and outlet chambers. When this difference is 20 lb. the filter should be cleaned. A water relief valve automatically prevents the building up of excessive pressure in the pump discharge line.

All the main valves are on one stem, and the single hand wheel places the filter in operation or by-passes it. The lower disk has seats above and below it, and its position determines the path of flow through the filter.

The number of cartridges varies with the size of the unit. Each cartridge consists of two concentric cylinders of heavy perforated brass tubing covered with linen terry. The filtering medium conforms to the shape of the cartridge, the closed end being drawn down to a nice fit over the inner cylinder, reversed over the outer cylinder, and the other end tucked in and clamped by a brass cap. This construction compels a double filtration, so that any matter which gets through the first layer of terry is practically sure to be caught in the second layer.

The facility with which the filter may be cleaned is an important advantage. On by-passing, opening the drain and lifting the filter cover all the foul media can be removed, and renewed with little effort. The Terry from each cartridge is slipped off with one motion and fresh slipped into place and clamped by a gentle downward pressure, as shown in Fig. 4. The dirty cloth, after being boiled in water and soda, is ready to be used again. The heavy impurities which may cling to the walls of the filtering chamber or settle to the bottom may be blown out by opening a sludge valve. The frequency of this, as of the other cleaning operations, varies according to the conditions peculiar to each plant, and is easily determined after a short operation.

The capacity of such a filter varies according to the amount of surface of filtering material. Nine sizes are made, having  $1\frac{1}{2}$ , 2,  $2\frac{1}{2}$ , 3,  $3\frac{1}{2}$ , 4,  $4\frac{1}{2}$ , 5 and 6 in. admission and discharge openings, respectively. In the No. 1 Blackburn-Smith filter 7500 lb. of water per hour may be filtered, and through the largest, the No. 9, 250,000 lb. per hour.

#### Electric and Steam Railroad Statistics.

Steam and electrical operation of the railroads of the United States, 216,974 miles being included in the accounting, were compared in a paper before the Institute of Electrical Engineers. The country was divided into 10 sections, of which the smallest, New England, has 8094 miles of line, with gross earnings of \$14,511 per mile, steam operating expenses of \$10,493 per mile, estimated electric operating expenses of \$8604 per mile, and an estimated saving of \$1889 over steam. The interest at 5 per cent. on electrical equipment, excluding rolling stock, is \$647 per mile, showing a net saving of \$1242 per mile.

The greatest estimated saving is in a group composed of New York, Pennsylvania, New Jersey, Delaware and Maryland, with 23,281 miles of line. Here the respective figures per mile are:—gross earnings, \$20,752; steam operation, \$13,671; electric operation, \$11,210; saving, \$2461; interest, \$790; net saving, \$1671. The next greatest advantage is shown by a group composed of Ohio, Indiana and Michigan, with 25,208 miles. The figures here are, in the previous order, \$12,483; \$9198; \$7542; \$1656; \$640; and a net saving of \$1016. Other groups show gross savings ranging from \$737 per mile to \$930, and net savings ranging from \$276 to \$414 per mile. For the entire United States the figures are given as follows:—gross earnings, \$9598 per mile; steam operation, \$6409; electric operation, \$5255; saving, \$1154; interest, \$516; and net saving, \$638. Applied to the entire railroad system, this latter figure would amount to the enormous total of \$138,500,000 per annum.

W. L. Churchill refers in the *Metal Industry* to the test of galvanized products made by the Government and other large consumers before accepting such articles. It consists of immersing for 1 minute in a standard solution of sulphate of copper, specific gravity 1.185 at 75 degrees F., then rinsing with water and wiping dry. Ordinarily three immersions are considered a sufficient test, but sometimes four or five are required. The test indicates by depositing copper on the sample if the work is insufficiently or improperly coated.

The first cargo of steel bars, weighing 20 and 30 tons, which was ever sent from Spain to the United Kingdom was shipped from Bilbao to Newport, Wales, in June.

### The Davidson Automatic Drill Chuck.

An ideal drill chuck should fulfill the following requirements: It should have a positive, nonslipping, nonmarring and nonlocking grip; it should be accurately self-centering and readily accommodate any drill up to the maximum capacity size; it should have no loose parts, neither keys to lose nor internal pieces to work out of place; it should permit change of drills without stopping the drill press, and it should eliminate to the utmost the item of wear, so as to avoid deterioration and maintain its accuracy.

All of these requirements are claimed to be met in the chuck herewith illustrated and made by the Davidson Chuck & Machine Company, 524 West Sixteenth street, Chicago, Ill. Fig. 1 shows the general external appearance of the chuck, and the principle of its operation is illustrated by Fig. 2. Four multiple sets of gripping jaws, *a*, of cam form, are caused to move simultaneously and in the same manner by the engagement of pins in a slotted plate. The normal tendency of the jaws is to close under the influence of a light spring; consequently when a drill shank, *b*, is inserted it is held with a light grip. The resistance offered by the work to be drilled instantly tightens this grip by rolling action, and the grip is the stronger the greater the force tending to cause it to slip. As shown by broken lines *c*, *d*, *e*, *f*, through

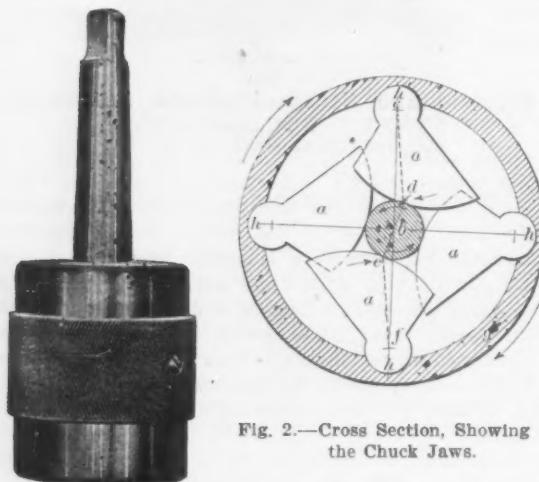


Fig. 2.—Cross Section, Showing the Chuck Jaws.

Fig. 1.—The Davidson Automatic Drill Chuck.

the jaws and drill shank, the gripping is secured by a toggle effect, the jaws being so formed that on no size of drill can the toggle be closed completely—that is, locked in its grip. To release the drill, therefore, it is necessary only to oppose the slight spring pressure in opening the jaws.

The jaw sets are assembled within a steel shell, *g*, abutting against grooves, *h*, on the interior, and all acting in unison; the chuck is accurately self-centering for all sizes of drills. Any size of shank, from a fine sewing needle to the largest drill within the capacity of the chuck, is grasped and held with equal positiveness and in perfect center. To release the jaws the knurled sleeve on the outside of the shell is retarded by grasping with the hand while the spindle is running, and, the movement to open the chuck being opposite to the drill press spindle rotation, the jaws are retracted, allowing one drill to be removed and another inserted. When released the jaws close again lightly, either empty or on a new drill shank.

This provision of means for changing drills quickly, without stopping the press, is of great value in the time saved. This chuck used on work requiring frequent changes of drills may easily add 30 to 60 min. per day to the productive working time of a drill press, a gain of importance when considered as equivalent to from 6 to 12 per cent. of an eight-hour day, or as amounting to from 156 to 312 hours per year. Ranges of capacity are not by steps—that is, no more than one size of chuck is required to suit all sizes of drills within the working

power of any drill press. The range of drill sizes for any given size of chuck is from zero up to that size.

The chucking being affected by rolling action, there is little or no wear on the jaw faces nor cutting of drill shanks, and wear being negligible the durability is correspondingly great.

### A Notable Western Water Power Plant.

Water power development of large scope has been taking place at Nine-Mile bridge on the Spokane River, Washington. According to the *Engineering Record*, the work includes the construction of a masonry dam and power house, of which the former, when completed, will be 60 ft. high and 75 ft. wide at the base, the entire structure containing over 17,000 cu. yds. of concrete and stone, and being 455 ft. long. The power house alone, which forms a part of the dam, measures 110 by 114 ft., and is 111 ft. high, being very nearly cubical in shape. Provision is made for the installation of four turbines of 6000 h.p. each, direct connected to generators, but the present outfit is only two units.

At the site of the dam the river runs through a gorge 300 ft. wide and about 100 ft. deep. The depth of the stream, which ran close to the west bank, was about 15 ft. A row of timber cribs 200 ft. long and 20 ft. high was sunk along the east bank. Cross cribs were then sunk in the stream, perpendicular to those first placed, thus forming a cofferdam 150 by 200 ft., and diverting the stream to the east side of the gorge. These cribs were made as tight as possible with brush and earth, and the water leaking in was kept down by four pumps of a combined capacity of 12,000 cu. ft. per hour. Within the cofferdam the power house was built. Its foundations were carried down about 30 ft. below the normal water level, while the walls were carried up above the flood height of the stream before the latter was turned back into its regular channel. The front wall of the power house was provided with by-pass openings, through which the water was allowed to flow during the construction of the rest of the dam.

### Sherardizing or Dry Galvanizing.

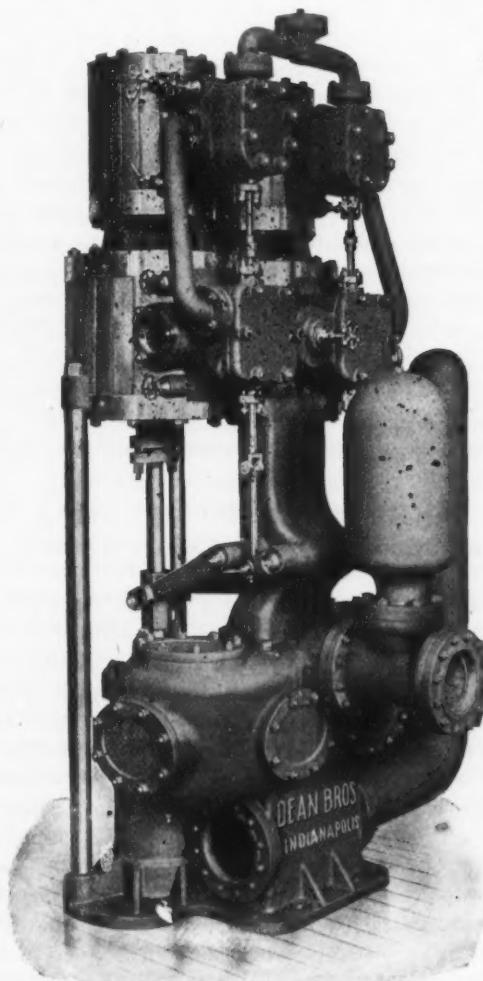
The United States Dry Galvanizing Company, 34 Pine street, New York, has acquired the American rights to the patents of Sherard Cowper-Coles of London, England, covering the process of dry galvanizing called Sherardizing, which has been the subject of several articles in *The Iron Age*. The product of this process not only stands the laboratory tests, but has stood the test of five years actual usage in England and other countries. The process is not only cheaper than hot galvanizing, but the product is stated to have superior durability. A specific instance of this is a Sherardized chain, which, after nine months' continual immersion in sea water off the coast of Ireland, showed no sign of corrosion or wearing. A peculiar feature of this process is that Sherardized articles readily take a polish similar to that of nickel plate, holding the luster as well as nickel plate. It is the policy of the company to grant factory rights.

The city of West Allis, Wis., the home of the Allis-Chalmers Company, is to undertake in the near future a substantial public recognition of the achievements of the veteran engineer, Edwin Reynolds. Through the united action of the citizens, including every official, department head, foreman and many employees of the great works, a monument is to be erected to Mr. Reynolds and a park and boulevard named in his honor. The park will be in the central part of West Allis and the erection of the monument and a drinking fountain with a statue of the great engineer will be its crowning ornament. The main street, leading to and through the park, will take the name of Reynolds Boulevard. Mr. Reynolds has for many years been actively engaged with the Allis-Chalmers Company and is still a resident of Milwaukee, though at present he devotes little of his attention to business affairs.

### A Dean Brothers Vertical Duplex Elevator Pump.

Economy of floor space is the principal reason for making any pump of vertical pattern. Few buildings requiring elevators have very much space to devote to the plant, and it follows that a compact design is of special importance in a pump intended for hydraulic elevator service. The pump illustrated is built by the Dean Brothers Steam Pump Company, Indianapolis, Ind., particularly for that work, but it is equally efficient as a water supply pump, a fire pump or pump for any purpose where considerable water pressure is needed and the room for installing it is limited.

It is designed for steady and long periods of operation without the frequent need of packing or making repairs, but when it is necessary to repack the cylinders the work can be conveniently and quickly accomplished. The steam cylinders are tandem compound and are jacketed, so that the pump will be economical in steam consumption. Adjusting valves are provided for regulating the stroke of the pistons and a by-pass valve, by means of which high



A Vertical Duplex Elevator Pump Built by the Dean Brothers Steam Pump Company, Indianapolis, Ind.

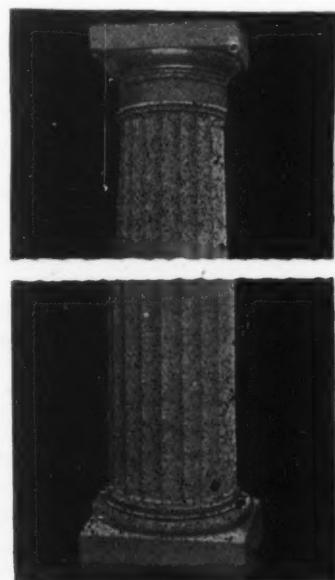
pressure steam may be admitted to the low pressure cylinder if necessary. Forged steel is used throughout in the valve gear.

The piston rods are separable at the crossheads, which allows steel rods to be used in the steam cylinders and brass rods in the water cylinders. The water valve area is large and access to the valves is had by the large hand-holes provided. The rods supporting the steam cylinders are carried down to the base of the pump cylinders, leaving ample room for removing the upper heads of the water cylinders. Air and vacuum chambers are furnished.

Every part of the pump is designed for convenient accessibility, and all studs, nuts, and bolts can be unscrewed with a common monkey wrench.

### Sheet Metal Building Columns.

Sheet metal columns for buildings are a product of the Union Metal Post Company, Canton, Ohio. They are offered in various architectural styles, of which the accompanying illustration shows an example of Doric fluted type, and are made of galvanized sheet steel. On account of their construction they are held to be practically indestructible and capable of resisting climatic conditions. They are finished to give the clean cut, rich



Broken View of a Sheet Steel Porch Column.

effect obtainable in marble or granite, a condition difficult to secure in wood. They are naturally light in weight and thus easy to handle, and the claim is made that they will support heavier loads than wooden columns. In finishing them they are treated to prevent paint from cracking and peeling, and any kind of good paint, it is stated, may be applied.

### Progress in Warship Design.

The year 1906 marked a transition in warship design, —an enormously increased fighting efficiency per unit of displacement. A greater area is covered by armor of a considerably higher resisting power per inch of thickness, which is, in consequence, more costly in production. As a result, the whole of the fighting will be done within effectively protected quarters, rendering inefficient the light rapid fire guns of the enemy, up to a bore of about 6 in.

Still more has been done in the way of increasing costs, however, by the great changes taking place in the main armament of the ships, a number of very heavy guns being used, in place of four such guns in combination with a number of lighter guns. The cost of a pair of 12-in. guns, with their barbettes and mountings, is about \$500,000. When 10 such weapons are used, this item alone accounts for \$2,500,000 of the cost of the completed vessel. As a result, in spite of the greatly augmented speed, which means much in the way of cost, the hull and machinery of the latest battleships represent but 45 per cent. of the total cost of the vessels, as compared with about 60 per cent. a few years ago. Six years ago the average cost in Great Britain of large warships was about \$350 per ton of displacement; this figure has now become \$500.

The Pacific Coast offices of the Jones & Laughlin Steel Company, Pittsburgh, which since the earthquake have been located at 2174 Market street, San Francisco, are now permanently located in the Crocker Building in that city.

# THE IRON AGE

1855-1907.

New York, Thursday, August 15, 1907.

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A. I. FINDLEY,	- - - - -	
RICHARD R. WILLIAMS,	- - - - -	HARDWARE EDITOR

## The New Cuban Iron Ore Deposit.

The iron ore developments in the Mayari District of eastern Cuba, of which details are given elsewhere in this issue, promise to be the most important, if the carefully made estimates of the engineers are borne out, since the discovery of the Mesaba range in 1891. Indeed, it was some years after Mesaba range ores came upon the market before any one, even in that time of extravagant claims, had the hardihood to estimate the ultimate yield of the new district at any such figure as is now put forth, on the strength of thorough exploration, for the Pennsylvania Steel Company's latest acquisition. Here is one indication at least of the change that has come over the ore situation in 15 years: The Mesaba "boomers," whose claims of tonnage have been proved to be moderation itself, were freely branded as enemies of the new range and of the whole ore trade, because of the cheapening effect of their talk upon the prices of all lake ores. To-day a 500,000,000 or 600,000,000 ton addition to the supply of ores available to American steel works is announced without so much as a ripple in the ore market. Far from being a bear argument, it comes as so much reinforcement of the already strong position of the American steel industry. There is a difference between a blast furnace capacity absorbing 15,000,000 tons of ore a year, as in the year of the Mesaba range's first shipment, and a capacity like that of to-day, requiring each year over 50,000,000 tons of ore.

The new Cuban find means much to the Pennsylvania Steel Company, which, with its limited reserve of Cuban hard ores and its share in the output of the Cornwall hills, has been dependent in part upon the Lake Superior ore market. How much it means may be judged in part from the fact that the company's engineering staff has concentrated its efforts for more than two years on the problems involved in the adaptation of the Mayari ores to its needs. These problems were both mechanical and metallurgical, and, as indicated in the account given on other pages, their solution has given the new ores a large part of the value they have to-day.

What, if any, portion of the Mayari ores will become available for other Eastern steel makers is a matter for the future. Whatever tonnage comes to the United States will strengthen by so much the position of the East. That section has seen the disadvantage of even its partial dependence upon lake ores increased in recent years by the declining iron content of these ores and the increasing proportion of Mesaba ores with their higher moisture. Both are accentuated by the long rail haul. The Mayari deposit and the knowledge that it is

of very large extent have brought out the suggestion in some quarters that Cuban ores and Virginia and West Virginia fuel will some day be assembled on the lower Chesapeake Bay. Newport News, as the terminal of the Chesapeake & Ohio Railroad, and Lambert Point, across the bay, the terminal of the Norfolk & Western, or some point at which both roads could be utilized, would afford an advantageous rate on coal, in case by-product coke ovens were erected at the seaboard, or on coke, if it should be regarded more economical, as it certainly would with beehive ovens, to produce the coke at the mines. The latter plan would permit of utilizing fine coal for coke, leaving the coarser grades for the coal market. The day of a large steel plant at the tidewater outlet of the Virginia and West Virginia coal roads may not come in the near future, but it has doubtless been set forward by the development of the Mayari ores.

It may be of interest to note that in the Swedish Government report on iron ore, which attracted some attention last year, the United States was credited with 1,100,000,000 tons of workable iron ore deposits. That report was accompanied by the claim, put forth on behalf of geological science, that the extent of workable iron ore beds is known to within a margin of possible error not exceeding 5 per cent. The Mayari deposits alone, on the experts' estimate, supply more than a 5 per cent. error in the Swedish estimate, which was about 10,000,000,000 tons for the entire world's supply. Therefore, taking no account of the probability that in the United States alone is more than half the amount above credited to all the iron bearing countries of the world, the story of the new Cuban district is full of suggestion to the prophets of an iron ore famine. Why should it be doubted that other hundreds of million tons will be added to the world's workable reserves when there is concentrated on the search a like combination of talent, determination and capital?

## Railroads Assisting Export Business.

Some of the important trunk lines which handle export traffic are working out plans for handling this class of freight which will have far reaching results in promoting the export business of American manufacturers. The railroads hope that by the new service which they are working out they can get freight to the seaboard promptly, on the date specified by the shipper, so that the exporter will have no trouble in making contracts with the steamship companies for "specific sailing."

Heretofore only a small proportion of export trade has been contracted with steamship companies to be cleared by a particular steamship. There has been so much uncertainty in the time that cars would arrive at the seaboard that an exporting manufacturer, whose plant is located at any considerable distance from the port of clearance, has had to await the convenience of the steamship company to take the goods at any time after arrival. A car might take two or three days to go from a point in Ohio or Pennsylvania to New York, Philadelphia or Baltimore, or it might be several weeks in transit. The exporter cannot book a shipment for a particular steamer under such conditions, because he would have to pay for the space contracted whether his goods reached the steamship or not, and the ocean carriers have discouraged specific booking to save trouble and friction. The foreign buyer at the mercy of this slipshod system of transportation does not know whether his goods will arrive in one month or six months after

leaving the factory on this side. The uncertainty in transit has been one of the greatest drawbacks in the development of American export trade.

Importers in this country have almost incredibly prompt service from European cities. European manufacturers and shippers have no trouble in booking their shipments for specific sailing, and the buyer on this side receives his goods within a very few days after the invoices arrive by mail. This is especially true of high class freight. Even as far west as Chicago importers get their goods regularly within three weeks after leaving interior towns in England or Continental countries, and it is very seldom that a shipment is delayed in transit. Dry goods have been carried by ordinary freight service from Paris to Chicago show windows in 12 days.

Most of the trunk lines have given good service, both east and west bound, on high class less than carload shipments, for which they operate fast freight lines, and they are also prompt in handling packing house products and other perishable freight, but the ordinary manufacturer who ships in carloads has received no special service unless his business is large enough to justify shipping in train loads, which can be followed by wire. The ordinary carload drifts into the general current of freight moving in its direction, and the only certainty about its arrival is that yard and train men will not exert themselves to take it farther than the destination shown in the waybill.

Last winter the leading trunk lines entered into an agreement by which they advanced to 50 cents per diem the rental that they paid to other roads in the agreement for the use of cars, and on July 1 last this agreement became universal, through action by the American Railway Association. This increase in the per diem rate has awokened the seaboard lines to the fact that something must be done to bring order out of chaos. On one of the leading roads terminating at Jersey City the average detention of export cars awaiting steamers was 10 days last year. On cars originating at Western points the detention is naturally longer, often 20 or 30 days, owing to the greater uncertainty in transit, and the short seaboard lines will sometimes lose in car per diem more than the proportional of the through rate.

Until recently a great deal of export freight was moved to the seaboard on local bills of lading, to be sold after arrival, or to await a bargain in ocean freight. The railroads have cut off the privileges formerly extended to the brokers who handled this class of business, which is now brought under regular local car service rules, and an export bill of lading has become a necessity on practically all commodities. Even the coal trade is being brought under car service rules at tidewater. The railroads at Baltimore established the past year a demurrage rule on coal for transshipment by water, allowing either 12 days straight free time or a five-day average plan, at the option of the shipper. It is said that the five-day average has proved more satisfactory, as the shipper who works under the 12-day rule has to pay more demurrage than under the average rule.

Neither the railroads nor the steamship companies have sufficient storage room at the piers to unload carload freight as it arrives and hold it until it can be loaded on steamships. The operating officials of the roads want to charge the shipper demurrage anyway, and make him pay what the roads lose in per diem charges, but it is doubtful whether they could legally do this under the export bill of lading, and no one knows whether the remedy would kill or cure.

The simplest way for the railroads to settle the ques-

tion is to give export cars sufficient preference in movement to get them through within a certain number of days. This plan is being tried by one of the leading systems, and there is no doubt that it can be carried out successfully. When the shipper knows that his car will go through in a certain number of days he can make a contract for specific sailing, in which case the car will be unloaded promptly when it arrives at the seaboard and everybody interested will be happy. The railroad will save the per diem expense if the shipment is made in a "foreign" car, or will get its own car released promptly, the steamship company can book shipments in advance knowing that they will be at the dock at the time agreed, and the foreign buyer will know when to expect his goods and can arrange his sales accordingly. Even the banks will gain by bringing order out of chaos, for they can handle their foreign exchange in a more satisfactory manner. It will then become possible for the ordinary manufacturer to engage in export trade on a business basis.

#### Prosperity for Welsh Tin Plate Works.

The Welsh tin plate industry is now reported to be prosperous beyond record, and the output for 1907 is expected to exceed 700,000 tons. Prophecies of ruin to the Welsh manufacturers of tin plate had quite as general acceptance 10 years ago, after the American tin plate industry had demonstrated its ability to care for the greater part of the domestic demand, as was accorded earlier to predictions of the failure of the American attempt to become independent of Wales. A steadily expanding world demand for tin and terne plates has been gradually counteracting the pessimism that had taken possession of the Welsh trade, and to-day there is a more hopeful view of the future than has ever been taken. Whereas before the establishment of American tin plate manufacture this country took much more of the Welsh product than all other countries combined, the United States to-day receives less than one-seventh of the exports from Wales, though still the largest single customer. For the fiscal year ending June 30 our imports of tin and terne plates were 63,629 gross tons, as compared with 53,937 tons in the previous year. Meanwhile our production is at the rate of about 550,000 gross tons a year.

To what extent, if any, the increasing world demand for tin plate is due to any enterprise on the part of the leaders in the Welsh industry, does not appear. A few years ago, when the outlook was far less promising, little response could be stirred up to the urgings of the British trade press that some money be spent in the effort to create new uses for tin plates. It was suggested that in the packing of certain classes of goods for shipment long distances in international trade, tin plates might be used to a far greater extent if the proper effort were put forth to manufacture and push a light coated plate produced considerably below the price of ordinary plates. The attempt to get concessions from workmen with a view to a larger operation of the South Wales works met with little success. The present buoyant condition of the industry appears to be due almost wholly to the general wave of prosperity that has brought enlargement of nearly all lines of trade. Russian demand expanded, as the disorders in the Baku District quieted down. Japan has been a heavy buyer, also. In fact, Belgium and Australia alone of the 11 principal countries to which Great Britain ships showed a falling off in the first six months of 1907. British exports for the half

year were 205,273 tons of tin plates, and 36,882 tons of black plates for tinning, a gain of 20 per cent. over the record for the first six months of 1906.

Oil trade expansion has been without doubt an important factor in the greater demand upon tin plate works, and the large consumption of gasoline for motor purposes promises a continuance of the movement.

## The Board of Conciliation Award.

The Board of Conciliation appointed to settle the dispute between the Western bar iron manufacturers and the Amalgamated Association on the puddling and finishing scales, after holding sessions for some days in the Hotel Rider, Cambridge Springs, Pa., made its award on Saturday, August 10. The award was decidedly in favor of the puddlers and finishers, the puddlers being granted an advance of 50 cents a ton and the finishers a proportionate advance. The board was composed of Warner Arms, representing the Republic Iron & Steel Company, H. W. Heedy, representing the Western Bar Iron Association, Ben Davis of Birmingham, Ala., and John J. Buckley of Youngstown, Ohio, representing the Amalgamated Association. The fifth party was M. J. Hanley of Muncie, Ind., who acted as arbitrator. The award made by the board is as follows:

### Memorandum of Agreement.

This was accepted entirely as adopted by the Amalgamated Association at its convention in Toledo, Ohio, in May, with the exception that paragraph No. 2 was changed to read 140 lb. instead of 130 lb., this paragraph reading as follows:

Second.—On all mills working iron or steel, weighing 140 lb. or more, extra help shall be furnished to the heater, the same to be paid by the company. Said help shall also assist the rundown to charge.

### Boiling Scale.

This was adopted entirely as formulated by the Amalgamated Association at its Toledo convention, and gives the men an advance of 50 cents a ton, the boiling scale as adopted being as follows:

Based on actual sales of Bar Iron, as per conference agreement.

	Boiling per ton, 2,240 pounds.	Boiling per ton, 2,240 pounds.	
Bar Iron.			
1c.	\$5.00	1 11-20c.	\$6.37 1/2
1 1-20c.	5.12 1/2	1 12-20c.	6.50
1 2-20c.	5.25	1 13-20c.	6.62 1/2
1 3-20c.	5.37 1/2	1 14-20c.	6.75
1 4-20c.	5.50	1 15-20c.	6.87 1/2
1 5-20c.	5.62 1/2	1 16-20c.	7.00
1 6-20c.	5.75	1 17-20c.	7.12 1/2
1 7-20c.	5.87 1/2	1 18-20c.	7.25
1 8-20c.	6.00	1 19-20c.	7.37 1/2
1 9-20c.	6.12 1/2	2c.	7.50
1 10-20c.	6.25		

Swarth is to be 50 cents a ton below boiling.

All other foot notes under the boiling scale are unchanged.

The scale for muck rolling remains at one-eighth of the price for boiling.

Busheling on cinder bottom is to be 62 1/2 per cent. of the boiling scale for light scrap, and 47 1/2 per cent. for heavy scrap.

Swarth, light and heavy scrap are to be divorced from the boiling scale and are to be given separate columns of figures.

### Busheling on Cinder Bottom.

All foot notes are to remain the same as last year and to appear under the scale to which they apply.

Under the scale on busheling on cinder bottom, heavy scrap is to be the same as adopted in the Toledo scale.

Light scrap is to be given a separate column of figures based on 47 1/2 per cent. of the new boiling scale. On this scale, the limit of output is removed entirely, and in fact the limit of output has been removed on all scales, with the exception of boiling which remains at 2750 lb. per turn. Foot notes under the scale for busheling on sand bottom are unchanged.

The convention scales as adopted at Toledo for piles

on boards, knobbling, heating slabs and shingling were also adopted by the board.

### Bar and 12-in. Mills.

Rollers and catchers are to be paid the same as last year. All other men are to receive an advance of 5 per cent. except roughers up, who are to receive the same as the rougher down. This applies also to the scrap scale. Foot notes are the same as last year.

### Guide, 10-in., Rod and Cotton Tie Mills.

Under these scales rates were advanced 5 per cent. on all jobs.

### Special Steel Scale.

This scale as adopted at the Toledo convention has become a part of the Amalgamated scale for 1906-1907.

Foot notes remain the same as in the scale of last year.

It may be stated that neither the Amalgamated Association, the Republic Iron & Steel Company, nor the Western Bar Iron Association stated its willingness, verbally or otherwise, to accept the award of the Board of Conciliation. No advices have yet been received by the Amalgamated Association from the Republic Iron & Steel Company or the Western Bar Iron Association as to whether or not the award will be accepted. The men have been working in the Western bar iron mills since July 1 up to August 10 under the terms of last year's scale. Commencing Monday, August 12, the men are to receive the rate of wages as fixed by the award of the Board of Conciliation, but which has not yet been formally adopted.

## The International Iron Molders' Convention.

After a three weeks' session at the Continental Hotel, Philadelphia, Pa., the International Iron Molders' Union closed its twenty-third session August 9. A number of important changes in the constitution were adopted. The organization will in future be known as the International Iron Molders' Union, so as to cover its extensive Canadian membership. The membership dues were increased from 25 to 40 cents per week. The apprentice question was another important subject acted upon by the delegates, and the recommendation of President Valentine that the ratio of one apprentice to eight journeymen be changed to one in five was adopted.

No change was made in the headquarters of the union. The proposition to establish an insurance feature was adopted, and plans for putting it in force were approved. The election of officers for a term of four years was held on the last day, and the executive force was re-elected, as follows:

President, Joseph F. Valentine, Cincinnati, Ohio; first vice-president, Michael J. Keough, Green Island, N. Y.; second vice-president, John Campbell, Quincy, Ill.; third vice-president, John R. O'Leary, Cincinnati, Ohio; fourth vice-president, Lawrence O'Keefe, Detroit, Mich.; secretary, E. J. Denney, Commercial Tribune Building, Cincinnati, Ohio; treasurer, Alex. Faulkner, Cleveland, Ohio; editor *Iron Molders' Journal*, John P. Frey, Cincinnati, Ohio.

The following were chosen members of the Executive Council, also serving for four years: John I. Nolan, San Francisco, Cal.; James Brown, Chicago, Ill.; George Gunrey, Indianapolis, Ind.; John Manning, Sheffield, Ala.; John Bradley, Poughkeepsie, N. Y.; W. T. Probert, Brooklyn, N. Y.; Wm. S. Skimmerton, Toronto, Canada.

The time of holding the next meeting of the union is indefinite, as this is always decided upon by a referendum vote.

The United States navy to-day has in commission 22 battleships of an aggregate of 291,679 tons. They carry guns giving a total broadside fire of 88 12-in. and 13-in., 74 8-in., 30 7-in. and 81 6-in., giving a total of 51 tons of metal at one broadside discharge. The Japanese have in service 13 battleships of 180,140 tons, carrying guns with a total broadside of 44 12-in., 12 10-in. and 78 6-in., giving a total broadside fire at one discharge of 22.8 tons of steel.

## The International Harvester Company's Merchant Mill.

As has already been announced, all of the International Harvester Company's iron and steel plants in the Chicago district were recently combined into a subsidiary corporation—the Wisconsin Steel Company. A new merchant mill, designed and built by the Morgan Construction Company, Worcester, Mass., has just been started, which forms, in connection with another Morgan mill installed four or five years ago, an interesting layout for the economical and accurate production of the wide range of merchant bars and shapes used by the implement trade.

### The Company's First Merchant Mill.

The first merchant mill includes a continuous roughing train of eight stands, which takes a 4x4-in. billet. Beyond this mill, and to one side of the line of feed, is a semi-continuous finishing mill of six stands. Cooling beds for both the continuous and finishing trains are provided. This mill was designed to handle rounds from  $\frac{3}{8}$  to 2 in. and equivalent sections, flats to 3 $\frac{1}{2}$  in. and angles to 1 $\frac{1}{4}$ x1 $\frac{1}{4}$  in.

At the time it was installed many doubted the possibility of covering such a wide range of product economically with one mill, but the experience has been satisfactory from the start, and some of the tonnages are the best ever published. For instance, in 1906 this mill rolled 92,254 gross tons in 614 turns, or an average of 150 tons per turn. In October of that year it rolled 11,146 gross tons. The following month 1860 gross tons of sizes smaller than  $\frac{1}{2}$  in. rounds were rolled, and in addition 5356 tons of larger sizes. The record on 1 $\frac{1}{2}$ -in. rounds is 642 gross tons in 24 hours. The production of the smaller sections is particularly interesting when compared with the production of the ordinary 8-in. mill turning out about 2000 tons per month, and brings out forcibly the great advancement made in rolling metals by the more extended use of continuous processes, generous investment and energetic management.

### The New Mill Designed for Heavier Sizes.

The saving effected by this installation was so marked that in the fall of 1905 it was decided to install additional rolling equipment to cover the heavier sizes rolled on the old mill and still heavier sections then purchased in the open market. The new mill was accordingly designed to receive billets 5x5 in. and 4x4 in., or slabs of equivalent section 11 ft. long, and to finish rounds  $\frac{3}{8}$  to 3 $\frac{1}{2}$  in. diameter or equivalent shapes, flats up to 12 in. wide, angles up to 5 in., Z bars up to 4 in., beams up to 5 in. and channels up to 6 in.

The mill is guaranteed to roll 100,000 to 110,000 tons per year on an average run of rolling orders, and with reasonably long runs on an average section should considerably exceed this, running up to at least 150,000 tons per year. In the first month after starting up, with part of the mill unfinished and a green crew operating single turn, 4000 gross tons of rounds ranging from 1 to 2 $\frac{1}{2}$  in. diameter were rolled.

### The Cooling Beds.

One of the most interesting features of the mill, apart from the wide range of product, is the provision made for cooling and handling the finished material. For this work two cooling beds, 100 and 160 ft. long respectively and three shears with assembling pockets are provided. Their connection with the mill will be described later.

The mill is of the semi-continuous type. Billets 11 ft. long, 5x5 in. and less, are delivered to the building on cars and worked through two Morgan continuous gravity discharge furnaces, from which they pass directly to a continuous train, consisting of eight stands of 16-in. rolls, through which the piece passes in most cases without any manual manipulation whatever and with not more than one turning by hand at the most. This section of the mill is designed for the heavier shapes already specified.

The finished piece is delivered direct from the eighth pass to a 100-ft. cooling bed. A hot saw and adjustable stop are here provided for cutting the material to length

before it is worked over the cooling bed. Both of the cooling beds in this mill are of the Edwards oscillating saw-tooth type, frequently described in connection with other Morgan installations. The pieces are worked across this bed on to a conveyor, from which they are delivered to a shear provided with an adjustable gauge bar and bundling pocket. If the mill is on long light sections, or on any section requiring more than eight passes, the piece is diverted at the sixth or seventh pass to a conveyor running parallel to the main mill. Its direction of motion is then reversed and it returns through a 14-in. mill to be again shifted, reversed and returned through two more 14-in. roll stands. From these it passes on to a 160-ft. cooling bed. The passage of the piece through these 14-in. mills is controlled by two boys from pulpits. For most of the sections no hand manipulation whatever is necessary. A third boy controls both of the cooling beds. After being worked across the 160-ft. cooling bed the stock may be sent in either direction.

If angles are being rolled they are sent back to an angle straightener, thence over a long conveyor to a shear and bundling pockets. If no straightening is required it passes forward to a shear and shear pocket similar to that provided for the 100-ft. bed. All of these pockets for finished material are commanded by two 20-ton cranes, which lift the assembled material from the pockets in slings and deposit it at the finishing end of the building, where ample space is provided for storage. One of the cranes is also used to supply billets to the furnaces. Tracks are provided both inside and outside the building for handling the finished material.

### The Power Equipment and Heating Furnaces.

The building, including the storage space mentioned, is approximately 115x720 ft. The mill is driven by a C. & G. Cooper cross-compound engine, directly connected at both ends of its main shaft to a driving shaft approximately 250 ft. long. This shaft carries bevel gears, through which all the rolls are driven. All the auxiliary machinery, such as mill tables, shears, cooling beds, straighteners, &c., is driven by electric motors.

The heating furnaces are fed by four Morgan producers, located close to the delivery end and provided with George automatic feeds. The gases are thus delivered to the furnaces at nearly the temperature of the producer, and the shortness of the gas flues makes the uniformity of firing secured by these feeds particularly desirable.

Provision has been made for another furnace, and when the heating capacity has been thus increased a second angle straightener and a fourth shear with bundling pockets can be installed at the mill end of the 100-ft. cooling bed, thus making it possible to break down on the first stands of the continuous train and finish angles on both beds at the same time. It should also be noted that the general arrangement is such that the rolls in the 14-in. mill can be changed while the mill is delivering its full capacity from its 16-in. train.

It is confidently expected that this mill will prove far ahead of any previous installation covering a similar range of product, both in capacity and in manufacturing costs.

The S. Obermayer Company, Cincinnati, Ohio, has just completed, at its Cincinnati plant, a factory for the exclusive manufacture of Kantbebat dry core compound. This factory has a capacity of 25 tons per day and from present indications the company's sales of this commodity will increase to a great extent. In this new core compound have been added some features which are new to the foundry trade. It bids fair to rival, if not exceed, any core compound which the Obermayer Company has put on the market in recent years.

The Legislature of Wisconsin has appropriated \$30,000 for the establishment of a mining school at Platteville, which is in the zinc and lead mining district. A building formerly used for normal school purposes will be the present home of the new mining school. Gov. Davidson has appointed a commission which will have in charge the management of the school, under the act of the Legislature.

## The Agricultural Implement Industry.

### Conditions Shown by the Census of 1905.

WASHINGTON, D. C., August 9, 1907.—The statistics of the manufacture of agricultural implements have been compiled for the census of 1905, which constitutes the first quinquennial enumeration of the manufacturing industries of the country. The period covered is the calendar year 1904, or the business year of each establishment most closely conforming thereto. The figures embrace the production of all implements used for tilling the soil, sowing or planting the seed, harvesting and preparing the crop for market. Steel has recently become the material of chief value employed in this industry.

#### Magnitude of the Industry.

The importance of this industry is shown by the value of farm implements and machinery in use on the farms of the United States, which in 1904 reached the sum of \$844,989,863, a gain of nearly \$100,000,000 since 1900. The invention and perfection of machinery for use in connection with agriculture have revolutionized farming in the United States, and thus have exercised a far-reaching influence upon the economic conditions of the nation. Moreover, a large proportion of the labor saving devices in use in the year 1904 on farms in all parts of the globe were of American design and manufacture. But in spite of the wide extent of its market the area of significant product with the United States is relatively small.

At the outset the industry was widely distributed in small shops over the country. The implements used were of simple construction, and their manufacture required little capital. With the progress in agriculture the demand grew for labor saving devices. The increased cost of producing such machinery required increased capital, and to make the industry pay under present conditions extensive and particularly expensive exploitation has been necessary. Indeed, the requirement for a large and increasing proportion of capital to product is now a marked characteristic of the industry.

#### Peculiarities of Classification.

The manufacture of agricultural implements is so closely allied to that of foundry and machine shop products that some establishments classified as "agricultural implements" at one census so change the character of their products as to come entirely or principally under "foundry and machine shop products" at a succeeding census, and thus drop out of the class in which they had been previously included. Such changes should be considered in comparing the statistics for the different censuses.

The following table embraces a comparative summary of the returns for the two census years 1900 and 1904:

#### Summary of Returns.

	1904.	1900.
Number of establishments.....	648	715
Capital.....	\$196,740,700	\$157,707,951
Salaried officials, clerks, &c. number	7,199	10,046
Salaries.....	\$7,572,646	\$8,363,210
Wage earners, average number...	47,394	46,582
Total wages.....	\$25,002,650	\$22,450,880
Men 16 years and over.....	46,631	46,174
Wages.....	\$24,777,846	\$22,358,158
Women 16 years and over...	579	214
Wages.....	\$191,308	\$66,042
Children under 16 years.....	184	194
Wages.....	\$33,496	\$26,680
Miscellaneous expenses.....	\$15,178,098	\$11,394,656
Cost of materials used.....	\$48,281,406	\$43,944,628
Value of products.....	\$112,007,344	\$101,207,428

The number of establishments in this industry has steadily decreased since 1860, until in 1904 there was less than half the number reported in 1850. To some extent this reduction is accounted for by the changes in classification, but a much more important reason is the absorption of small establishments by large ones. The centralizing tendency is further illustrated by the fact that the average capital invested and the average value of products per establishment increased from \$2674 and \$5133, respectively, at the census of 1850, to \$303,612 and \$172,550 in 1904.

The following table shows the number and kind of implements manufactured in the United States, as reported for 1904, as compared with 1900:

Output by Number and Kind.		
Kind.	1904.	1900.
Seeders and planters:		
Bean	7,210	200
Planters { Hand	86,553	129,515
Corn { Horse	83,719	78,135
Cotton	127,052	45,575
Potato	35,756	25,338
Beet	606	5,302
Drills { Corn	28,228	21,940
Grain	76,929	91,635
Grain sowers.....	33,546	36,862
Lime spreaders.....	521	474
Listers.....	23,012	26,995
Manure spreaders.....	22,236	5,263
Seed sowers.....	59,910	83,283
Tobacco transplanters.....	1,142	3,788
Implements of cultivation:		
Bean	232	189
Cultivators { Beet	3,459	2,008
Small	238,941	206,982
Wheeled	313,088	295,799
Celery hillers.....	1,070	130
Cotton scrapers.....	22,519	15,230
Cotton sweeps.....	8,098	75,311
Equalizers.....	67,852	74,168
Harrows { Disk	104,323	97,261
Other than disk	348,850	380,259
Hoes (dozens).....	331,620	277,173
Markers and furrowers.....	5,512	854
Disk	39,146	17,345
Shovel	121,899	102,320
Plows { Steam	1,599	207
Sulky or wheel	138,899	136,105
Walking	956,898	819,022
Potato coverers and hillers.....	2,938	3,052
Rollers.....	22,188	12,590
Stalk cutters.....	15,146	13,425
Harvesting implements:		
Grain cradles.....	30,056	36,163
Harvesters and binders and headers, grain	108,810	233,542
{ Bean	665	1,425
Corn	6,924	20,707
{ Other	3,161	6,283
Hay carriers.....	85,121	54,303
Hay forks { Hand (dozens)	345,297	152,840
{ Horse	62,801	51,770
Hay loaders.....	27,174	7,273
Hay rakes { Hand (dozens)	76,139	58,013
{ Horse	236,297	216,345
Hay stackers.....	8,670	12,069
Hay tedders.....	35,745	14,510
Mowers.....	267,692	307,561
Mowers and reapers combined.....	5,693	1,055
Potato diggers.....	11,703	21,033
Potato hooks.....	139,940	20,860
Reapers.....	60,996	35,945
Scythes.....	705,025	718,453
Scythe snaths.....	699,636	537,214
Sickles.....	247,716	440,660
Stackers.....	845	247
Seed separators:		
Bean separators	727	40
Other separators	12,100	1,707
Clover hullers	351	661
Corn huskers	1,327	10,726
Corn shellers { Hand	47,189	106,381
{ Power	6,082	8,185
Fanning mills.....	22,994	30,369
Horse power	2,237	1,314
Threshers { Steam power	7,950	3,651
{ And separators combined	....	5,394

#### Gains by Classes.

Horse drawn corn planters increased steadily from 1890 to 1904, while the number of hand corn planters advanced from 1870 to 1900 and then declined. Of implements classed as seeders and planters, bean planters, cotton planters and manure spreaders have made the most marked gains since 1900, and of implements of cultivation beet cultivators, celery hillers, markers and furrowers, steam and disk plows and rollers show the greatest proportional increase. Disk harrows show an increase over 1900, while all other varieties show a decline.

The advance of over 54,000 dozen since 1900 in the number of hoes manufactured indicates that no labor saving device has yet been invented to supplant this simple and useful instrument.

The more important harvesting implements show a decrease in number. The falling off in harvesters and mowers, however, should not be interpreted as indicating a decline in the use of such implements, for a greater number of improved harvesting machines are in use to-day.

than ever before. The decrease in number manufactured may be accounted for in part by the fact that important manufacturers in Illinois and Ohio reported a greater "carry over" from the year 1903 than ever before. Also most of the large farms are now supplied with elaborate labor saving devices, and as these are standardized, so that when repair is needed the worn out part may be easily replaced, new machines are not required for a long period of time.

The output of scythes has decreased steadily since 1880. Except in very rough and hilly regions the scythe has been displaced by mowing machines, which require less labor. Mechanical motive power has been successfully adapted to use in mowing machines and the auto-mower is now a frequent sight in city parks.

#### Increased Use of Iron and Steel.

It is probable that the tendency shown toward increasing cost of materials is in part the result of change in the character of the principal material, rather than an increase in quantity. Wood was superseded by iron, and that in turn by steel. Furthermore, prices of the same material fluctuated from year to year, so that only the most general deductions can be made from the returns for cost of materials.

Value of products showed no change commensurate with those recorded in number of establishments. The value of products of the industry in 1904 was approximately 16 times that of 1850. In the last 35 years the value of products has increased moderately but steadily. From 1900 to 1904, computed on the decade basis, the percentage of increase is slightly less than during the previous decade. It must be remembered, however, that the value of products in many industries has become so large that a small percentage often represents a great absolute increase.

Centralization is further emphasized by the geographical distribution of the industry. Of the total output the three leading States contributed nearly two-thirds, as follows: Illinois, \$38,412,452; New York, \$13,045,891, and Ohio, \$12,891,197. Chicago was by far the largest manufacturing center in 1904, but owing to the fact that nearly all the establishments in that city are under a single control the exact figures are withheld to avoid disclosing individual operations.

Implements of cultivation and harvesting, which, together form more than half of the total value of products, are by far the most important classes, and are thus obviously the staple articles at the present time in this industry. It is of interest, therefore, to analyze the geographic location of these products. Seven States, all except Kentucky bordering the Great Lakes, reported approximately four-fifths of the value of implements of cultivation, and four—Illinois, New York, Ohio and Wisconsin—nine-tenths of the value of harvesting implements. These values combined represent nearly 50 per cent. of the total value of products. Unfortunately, no comparison with 1900 is possible, as this segregation was not made at that census.

It is from harvesting implements that Illinois derives supremacy in the industry, although this State also leads in value of products of implements of cultivation. New York and Illinois produced 73.6 per cent. of the total value of harvesting implements manufactured. The preponderance of the value of these implements in the two leading States is noteworthy. It was the large value of this class of products in New York which enabled that State to outrank Ohio, since Ohio surpassed New York in the value of every other class of implements produced. In value of implements of cultivation Indiana is second, closely followed by Ohio and New York. Kentucky, Michigan and Wisconsin also passed the \$1,000,000 mark.

#### Exports.

The exportation of agricultural implements is one of the most important branches of the American export trade in manufactured articles, ranking fourteenth among all classes. Compared with the value of the other classes of exported machinery agricultural implements are far in the lead, being nearly twice as great as that of carriages, cars, other vehicles, &c., and builders' hardware and saws and tools. The United States leads the world

in the exportation of agricultural implements, with the United Kingdom as its principal competitor.

The value of the exports of agricultural implements for the fiscal year 1905 was \$20,721,741, as compared with \$16,099,149 in 1900. Of the total in 1905 mowers and reapers constituted more than one-half. Almost every agricultural country in the world imports American implements in quantities governed by its industrial and economic conditions. The use of labor saving machinery for agricultural purposes naturally depends largely on the cost of labor. The higher the wage the greater the demand for up to date implements.

W. L. C.

## Iron Ores of Northern Ontario.

#### Hematite in the Nepigon Field.

TORONTO, August 9, 1907.—The iron ranges east of Lake Nepigon and north of Lake Superior are being examined this season by a party of explorers sent out by the Ontario Bureau of Mines. From Dr. A. P. Coleman, who is at the head of the party, the Deputy Minister of Mines has received a letter giving advice of the finding of a small body of good hematite ore near the eastern end of the range. This may turn out to be a very important discovery. Portions of the range are being prospected with very satisfactory results by R. H. Flaherty, who is making tests with a diamond drill. Dr. Coleman's investigations there are in pursuance of a plan referred to as follows in the last annual report of the Bureau of Mines:

In view of the importance of obtaining all authentic information possible regarding the iron ore resources of the province it is proposed to undertake an examination of the iron ore ranges lying east of Lake Nepigon, which have frequently been referred to in the bureau's reports, and a visit to which in 1900 forms the subject of a brief note by J. W. Bain in the tenth report.

Mr. Bain's note, here referred to, gives an account of explorations to which only a few days were devoted in September, 1900. The small area then examined lay about 20 miles north of the mouth of Nepigon River and on the east shore of the lake of the same name. The place is known as Poplar Lodge, a winter post of the Hudson's Bay Company. Mr. Bain reported the occurrence of hematite iron ore, the portion of his report most directly bearing on this point being the following:

The material inclosed by these country rocks is a mixture of jasper and siliceous red hematite, with a little magnetite, the whole resembling very much the similar mixture found in the Michigan iron ranges. The amount of jasper present varies greatly. At some points the proportion rises to 50 per cent., and the material has a beautiful banded structure with alternating layers of jasper and hematite. The jasper is of good red color and stands out prominently against the background, so that where a portion of the surface has been smoothly finished by the glacier the effect is very artistic. In other places the jasper is entirely wanting and the hematite has lustrous surfaces on the cleavage planes. This appeared to be the highest quality, and a sample was selected for analysis. It yielded:

	Per cent.
Metallic iron.....	38.06
Silica .....	40.6
Sulphur .....	Traces.
Phosphorus .....	Traces.
Titanium .....	None.

From this it will be seen that although the ore is almost free from injurious ingredients it is much too low in iron to be of commercial importance; and, as might be expected, the two general samples show much more unfavorable results.

The two general samples mentioned contained 30.06 and 37.19 per cent. of metallic iron. An exhaustive investigation of the ore body was out of the question, as, according to Mr. Bain, both time and provisions were wanting.

As Poplar Lodge, on the east shore of Lake Nepigon, is only about 120 miles from Port Arthur—the Canadian Pacific Railway bridging a great part of this distance and Lake Nepigon and river affording a route for most of the remaining stretch—a body of hematite in the Nepigon field would be convenient to the new blast furnace of the Antikokan Iron Company.

#### Moose Mountain Ore.

Among the points of interest visited by the members of the American Institute of Mining Engineers, who were the guests of the Ontario government from the evening of

July 24 to the evening of July 31, was the Moose Mountain iron deposit in the township of Hutton. The party was brought from Sudbury over the 25 miles of new line that the Canadian Northern Railway Company has just completed between the two points named. The visitors seem to have been scarcely less impressed by the deposit than they were by the silver mines of Cobalt and the nickel lands about Sudbury. Both of these latter drew expressions of amazement from the party, but some of the members ventured the opinion that the iron ranges in Hutton township and to the north will prove to be an asset of very great permanent value. Some surprises are promised when the utilization of the output begins. Until the completion of the section of railroad between Sudbury and the mine, Moose Mountain was cut off from the market. The piece of road was finished barely in time to carry the American mining engineers over it. When the line is completed to the shore of Georgian Bay the shipping of the ore will be likely to begin.

As has been mentioned in former letters, the railroad line in question extends from Toronto to Sudbury and 25 miles beyond to the Moose Mountain mine. The section from Toronto to Parry Sound has been in operation from the beginning of this year, and that between Parry Sound and Sudbury is far advanced to completion. The 25 miles from Sudbury to the mines, as mentioned above, is now in use. The first point on Georgian Bay touched by the line in its course from Moose Mountain south through Sudbury is near the mouth of French River. There the ore could be turned over to lake carriers. The rail haul from the mine to that point would be shorter than that from the Minnesota mines to Lake Superior. The water route from the Canadian Northern's Georgian Bay port to lower lake ports is shorter than that from Lake Superior ports to the usual points of transfer on the lower lakes.

Besides the transportation advantages depending on the location of the ore body, the ore itself is said to be of high economic rank, being extremely easy to mine, of large metallic content and rather free from impurities. In a note prepared by Professor Miller of the Bureau of Mines for the information of the members of the Institute of American Mining Engineers the deposits at Moose Mountain are thus described:

On Hill No. 1 there is an exposure of a lens of magnetite 300 ft. by 100 ft. to 150 ft. The ore has been proved in two drill holes 257 and 400 ft. in length, run at angles of 45 and 60 degrees, respectively. This deposit is being worked by a cut which is 75 ft. lower than the top of the hill. In line with the larger axis of the lens, west by north one-half mile, another large ore body has recently been found 600 ft. by 50 ft. in size. East by south from No. 1 one-quarter mile another promising lens is being opened up.

So much for the accessibility of the ore. The following results of analyses are given in Professor Miller's note:

No.		Iron.	Sulphur.	phorus.	Titan.	Per ct.	Per ct.	Per ct.	lum.
1.	E. Coste's sample.....	51.45	0.001	0.058	None.				
	Professor Coleman's report.....	62.64	0.056	0.011	None.				
2.	E. Coste's sample.....	55.45	0.010	0.011	None.				
	Professor Coleman's report.....	59.12	0.08	0.016	None.				
2.	Extension E. Coste's sample.....	44.54	0.020	0.037	None.				
3.	E. Coste's sample.....	59.75	0.013	0.072	None.				
	D. D. Mann's sample (Hey's as- say).....	55.75	None.	0.001	None.				
	D. D. Mann's sample (Hey's as- say).....	53.07	0.100	0.014	None.				
4.	Professor Coleman's report.....	46.08	0.06	0.004	None.				
4.	(1) E. Coste's sample.....	42.76	0.015	0.036	None.				
4.	(2) E. Coste's sample.....	55.24	0.015	0.055	None.				
4.	(3) E. Coste's sample.....	44.19	0.002	0.011	None.				
5.	E. Coste's sample.....	31.70	0.026	0.051	None.				
6.	E. Coste's sample.....	54.30	None.	0.025	None.				

#### Other Ore Deposits.

Sixteen miles north of Moose Mountain a similar iron range is found at Burmarsh Lake. The first official notice of this deposit is contained in the Bureau of Mines report of 1896. It is thought to be an extension of the Hutton township deposits, on which is the Moose Mountain showing.

Another important iron ore property visited by the members of the Institute of American Mining Engineers while they were the guests of the Ontario government

was the iron range near Lake Temagami, of which T. B. Caldwell, M. P., is one of the principal proprietors. This is described as a very promising property.

#### A New Railroad to Develop Ore Deposits.

A mineral belt of great promise will be brought within the range of enterprise when a piece of railroad line the Ontario Government has just located is built. The section of road in question is that by which Cobalt is to be joined to Sudbury. The linking of the silver town to the nickel city was decided upon by the Government partly in response to a demand for the more direct forwarding of ore from the mines of Cobalt to the smelter at Copper Cliff, and partly because mining interests along the course of the proposed road were calling for an outlet. Throughout its 90 miles the road would pass through country that is practically worthless for agricultural use, but rich in minerals. The character of the mineral deposits along miles of the line from Cobalt is very much the same as that of the deposits for which that town is famous, whereas, toward the Sudbury terminus iron ore becomes of the greater importance. Mountains of good iron ore are said to have been staked in anticipation of the coming of the road.

The Dominion Bessemer Ore Company, Ltd., of Port Arthur, has been incorporated, with a capitalization of \$7,500,000. The purposes of the company are to take, acquire and hold as consideration for ores, metals or minerals sold or otherwise disposed of, or for goods supplied, or for work done by contract or otherwise, shares, debentures or other securities of or in any other company having objects similar in whole or in part to those of this company, and to sell and otherwise dispose of the same, with incidental and subsidiary powers. The provisional directors are W. F. Langworth and A. J. McComber of Port Arthur and R. J. Anderson of Minneapolis.

C. A. C. J.

#### The Effect of Scale in Locomotive Boilers.

The Engineering Experiment Station of the University of Illinois has recently issued bulletin No. 11, entitled "The Effect of Scale on the Transmission of Heat Through Locomotive Boiler Tubes," by Edward C. Schmidt, M.E., and John M. Snodgrass, B.S. This bulletin describes a series of experiments begun in 1900 by the railroad engineering department of the University of Illinois to determine the relation of the heat loss due to scale to the scale thickness. The experiments comprise tests on single tubes as well as tests of the entire locomotive boiler. The results of all the tests, plotted with reference to scale thickness, show great divergence in the heat loss, which is ascribed to differences in scale structure.

The conclusions derived from the tests are summarized as follows:—That for scale of thickness up to  $\frac{1}{8}$  in., the heat loss may vary in individual cases from insignificant amounts to as much as 10 or 12 per cent.; that the heat loss does increase with thickness in an undetermined ratio; that the mechanical structure of the scale is of as much or more importance than the thickness in producing this loss; and that the chemical composition, except in so far as it affects the structure of the scale, has no direct influence on heat transmission.

The bulletin is of interest to all who have to do with the operation of steam boilers in localities where pure feed water is not available.

German chemists have discovered a method of rendering the automobile agreeably odoriferous. To the cylinder lubricating oil usually employed other oils or substances are added having a boiling point which is lower than that of the lubricant, and which, in burning, emit a sweet odor which will annihilate that of the offensive gases. The following is a mixture proposed by these chemists, the ratios being by weight: Lubricating oil, 50 parts; oil of mirbane (nitrobenzol), 4 parts; oil of terpene, perfumed, 2 parts; and salicylic aldehyde (essence of vanilla), one part.

## Trade Publications.

**Electrical Apparatus.**—Peru Electric Mfg. Company, Peru, Ind. Bulletins. No. 1 deals with Peru porcelain insulators, cleats, bushings and tubes; sizes, prices and code words are given. No. 2 illustrates various types of National code standard cartridge fuse blocks. No. 3 pertains to National code standard tie buttons, fuseless rosettes, attachment plugs and weatherproof sockets.

**Cooling Towers.**—Alberger Condenser Company, 95 Liberty street, New York City. Catalogue No. 7. Describes at some length the applications and advantages of cooling towers, their construction and operation, and gives view of actual installations and drawings of typical ones. The cooling towers are made in two types, one in which the air is circulated by means of fans, and the other by means of a stack placed over the cooling tower proper, which produces a natural draft when the air becomes heated by the hot water from the condenser. Cooling towers for refrigerating plants and cooling towers in connection with steam turbine condensers are also dealt with. Brief descriptions and illustrations are also given of the Alberger barometric and surface condensers, Alberger Corliss pumping engines, Alberger dry vacuum pumps, Wainwright evenflow heaters, improved expansion joints, turbine expansion joints, and Alberger centrifugal pumps.

**Paints.**—Joseph Dixon Crucible Company, Jersey City, N. J. Pamphlet. Deals with Dixon's silica-graphite paint, which is claimed to adorn and preserve for a long period of time any class of metal or wood to which it is applied. This paint is manufactured in olive green, natural, dark red and black tints.

**Blue Print Machines.**—J. H. Wagenhorst & Co., Youngstown, Ohio. Pamphlet. Devoted to the Wagenhorst electric blue print machines, which will print large or small prints, it is claimed, with equal facility and perfection without any adjustment. Some references are given in the way of reproductions of telegrams received by the company, and also a list of 175 users.

**Crushers and Crushing Rolls.**—Sturtevant Mill Company, Boston, Mass. Pamphlets. Series No. 99 refers to fine crushers for hard rocks and ores, which are made in various types and sizes. The advantages of the unbreakable steel plate construction and cam and roll action embodied are pointed out, and illustrations show several types. Series No. 100 concerns Sturtevant balanced crushing rolls, which are designed so as to largely reduce the shocks which occur in ordinary rock-reducing machines. With these balanced rolls all shock movements are made in opposite directions at the same time and with equal force, and thus counteract and offset each other. Illustrations, descriptions and specifications are included.

**Gas and Gasoline Engines.**—Jacobson Machine Mfg. Company, Warren, Pa. Engineers' handbook. Size 6½ x 7½ in.; pages 108. This is a practical treatise on the gas and gasoline engine, and the object sought in the description and instruction given is to enlighten the engineer on the gas engine in general and to instruct in a way which will fit him for the operation of any gas or gasoline engine, bearing particularly on points pertaining to Jacobson engines. Each part of the engine is dealt with separately, explaining its object, construction, care and repair. Jacobson engines are made in automatic and hit-and-miss types, the former for close speed regulation and the latter for farm and general power purposes. Illustrations, brief descriptions and dimensions are given of water-jacketed air compressors of single and double cylinder types, and low pressure gas regulators. Some 22 pages of miscellaneous useless information, a telegraph code, list of parts of engines and a complete index are appended.

**Electric Fans.**—Sprague Electric Company, 527 West Thirty-fourth street, New York City. Catalogue No. 315. Illustrates and describes direct and alternating current electric fans manufactured by this company, on which improvements have been recently made. The line of direct current types includes 12 and 16 in. universal joint, combination adjustable desk and bracket fan motors, telephone booth motors with spring suspension, midget exhaust fans, and the Lundell single field coil fan motors. Alternating current types include the 12 and 16 in. desk and bracket fan motors with swivel and trunnion frame, spring suspension telephone booth motors, ceiling and column fan motors with two and three speeds, hanger rods for ceiling fans, 12 and 16 in. ventilating fan motors, compensator for fan motors, and fan motor appliances. A price-list of direct current fan motor parts, telegraph codes, a code word index and a list of catalogue numbers complete the contents of the book.

**Flue Welders and Turntable Motors.**—Draper Mfg. Company, Port Huron, Mich. Pamphlets. One refers to McGrath pneumatic welders for welding all sizes of flues up to 4½ in., and also to those adapted for swaging and scarfing flues, and to a pneumatic single cylinder flue welder. The other concerns McGrath pneumatic railroad locomotive turntable motors and attachments, and shows several installations of these. A list is given of some of the railroads using the motors.

**Electric Wires and Cables and Wire Rope.**—Hazard Mfg. Company, Wilkes-Barre, Pa. Two catalogues. One presents in a condensed form the company's line of wires and cables

for electrical conductors in the equipment of street railroads, electric light and power supplies and telephone and telegraph systems. Illustrations and dimensions are given of the numerous types. The other deals with wire rope of regular lay and improved Lang lay construction made from Swedish iron, English crucible steel, and plow steel rods. Illustrations, descriptions and dimensions are given of all kinds of iron, steel and galvanized wire rope, single and double galvanized strand, galvanized telegraph and telephone wire, wire rope clamps, chips and thimbles, wire rope sockets and hooks, and all appliances connected with the use of wire rope. A complete index is included in both books.

**Locomotives and Cars.**—Hicks Locomotive & Car Works, Chicago. Catalogue. Size 9½ x 12 in.; cloth bound. Descriptive of plant and products. Contains a brief history of the establishment of the plant in 1897, and its growth up to the present time. The company was originally organized for the purpose of repairing and rebuilding locomotives, which were purchased from the larger roads, rebuilt and sold to smaller lines. The business was soon extended to include passenger coaches and freight cars, and the works are now equipped to turn out cars of all descriptions, except steel. Some new locomotives are built, but it is chiefly the rebuilding of old ones that engages the attention of this department. Numerous views of passenger, dining and private cars built by the company are shown in the book, together with the various types of freight cars turned out. The building of gasoline electric motor cars is also a feature of the business which has received much attention, and charts showing the results of a series of operating tests of these cars are presented.

**Conveying and Transmission.**—Stephens-Adamson Mfg. Company, office Chicago, works Aurora, Ill. The July number of the monthly pamphlet issued by this company notes a number of important contracts recently executed for conveyors, bucket elevators, transmission machinery, &c. Included among these are a number of orders from foreign countries. The current number is especially devoted to the description of sand and gravel and coal conveying equipments, with illustrations showing details of mechanical appliances used in construction.

**Belting.**—The last issue of the *Phantom Monthly*, a periodical published by the New York Leather Belting Company, 51 Beekman street, New York, is of timely interest for the references it contains to the company's exhibit at the Jamestown Tercentennial Exposition. A large illustration at the center of the book shows the company's complete stationary exhibit, and another view its operating exhibit. Specimens of raw material, illustrations of the company's cutting method, samples of finished material are displayed, and the operating exhibit shows a number of unique applications of the various belts made for transmitting of power. This issue of the *Phantom Monthly* is also of interest for the considerable detail it gives of the company's organization, including brief biographies of the present officers: C. E. Aaron, president; J. R. Stine, secretary and treasurer; C. F. Aaron, general sales manager, and the department heads of the sale force. There is also quite a brief description of the New York, Brooklyn and Batavia factories, while the remainder of the book deals with the company's various brands of belting, how they are made, and the advantages they possess.

**Electric Pyrometers.**—William H. Bristol, 45 Vesey street, New York City. Catalogue No. 17. Size 9 x 12 in.; pages 40. Contains a general description and classified price-list of the different classes and styles of William H. Bristol low resistance pyrometers, both for indicating and recording all ranges of temperature up to 3000 degrees F. Illustrations with descriptions are included of several ways in which the instruments can be practically applied for commercial service. There is also given a list of users of the equipment, covering a great variety of industrial applications. The indicating pyrometer was described in *The Iron Age*, May 17, 1906, and the recording pyrometer November 8, 1906. A small portable pyrometer for measuring the temperature of molten metal was described July 4, 1907.

**Electrical Instruments.**—Weston Electrical Instrument Company, Waverly Park, Newark, N. J. Bulletins. No. 8 contains a description of the Weston standard portable multimeter, model 58, which combines the functions of a direct current voltmeter, millivoltmeter, ammeter, milliammeter, ohmmeter, ground detector and wheatstone bridge, though it is not claimed to be as accurate as the separate instruments made for each purpose. Bulletin No. 7 refers to the Weston electroplaters' voltmeter, model 131, described in *The Iron Age*, April 25, 1907.

**Exhausters and Separators.**—Buffalo Forge Company, Buffalo, N. Y. Leaflet. Deals with improved types of the Buffalo planing mill exhausters, dust separators and volume exhausters.

**Electric Hoists.**—Sprague Electric Company, 527 West Thirty-fourth street, New York. Leaflet and circular letter. Calls attention to the Sprague type S-7 hoist, a new design which is offered as the smallest and lowest priced electric hoist yet produced. It will lift 1000 lb. at 15 ft. a minute, and is supplied with or without trolley carriages and with single-speed controllers.

## NEWS OF THE WORKS.

## Iron and Steel.

The Washington Tin Plate Company, Pittsburgh, has been chartered under the laws of Pennsylvania with \$10,000 capital. The incorporators are Richard W. and Wallace Martin and John J. O'Connor, Pittsburgh.

The transfer of the West End Rolling Mill Company to the West End Iron Company, Lebanon, Pa., has been effected, and the officers are now: President, Christian Shenk; vice-president, Eli Attwood; secretary, H. F. Mattern. The plant is being improved.

The blast furnace of the Pulaski Iron Company, Pulaski City, Va., was blown out August 2 for relining.

No. 2 furnace of the Sheffield Coal & Iron Company, Sheffield, Ala., was blown out for repairs on July 20.

We are advised that there is no foundation for the report that Rush Furnace, Rush, Texas, now operated by the State, will pass into other hands. The furnace is running to its full capacity and the penitentiary officials have no intention of abandoning the manufacture of pig iron.

Since the purchase of the Star and Crescent Furnace, at Rush, Cherokee County, Texas, the new owner, W. H. Oatley, has been negotiating also for the Tassie Bell Furnace, at New Birmingham in the same county. A company may be organized to put both furnaces into active operation. Important repairs are now in progress at the Star and Crescent Furnace, which it is expected will be put in blast early in 1908.

The first cast was made by the Cambria Steel Company's new No. 8 furnace at Johnstown, Pa., on Wednesday, August 8, the operation of starting having been entirely successful.

In 24 hours recently the new plate mill at the plant of the Youngstown Sheet & Tube Company, Youngstown, Ohio, turned out 763 tons, and it is believed it is capable of rolling 1000 tons in 24 hours when sufficient steel can be furnished to keep it in continuous operation.

## General Machinery.

The Leader Jack Company has been organized at Bloomfield, Ind., and capitalized at \$10,000, to manufacture a patented jack. The officers are: Chas. E. Benefiel, president; Orland C. Thompson, vice-president; Milford Greene, treasurer, and Clyde O. Yoho, secretary. The company has not yet begun business.

The Portland Foundry & Machine Company, Portland, Ind., has been incorporated, with \$25,000 capital stock. The president is J. A. Long; vice-president, Wm. A. Fields; secretary, Frederick Grumme; treasurer, L. G. Holmes. Other directors are John Easterday and George H. Smith. It will succeed the Sixbey & Grumme Company, manufacturer of oil well supplies and general machinery.

A Pennsylvania charter has been issued to the Fay Machine Tool Company, Philadelphia, with a capital of \$50,000. The incorporators are George W. B. Fletcher, Otto W. Schaum and R. C. Fay, all of Philadelphia.

The John F. Byers Machine Company, Ravenna, Ohio, manufacturer of portable steam hoisting engines and other equipment, has placed a contract with J. C. Devine, Alliance, Ohio, for a patent storage vault, foundry and erecting room and blacksmith shop, which will give a total addition of about 14,000 sq. ft. of floor surface to its plant. The contract calls for the work to be finished about November 15, and includes everything except elevators and crane, contracts for these having also been placed.

The Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa., has received an order from the Spokane & Inland Railway Company, Spokane, Wash., for eight more 250-ton alternating current single phase locomotives. The Spokane Company constructed this road about two years ago from its home city to Lockhart, Idaho, a distance of about 150 miles, through one of the busiest mining districts of the Northwest. The road was one of the first in this country to install the single-phase electric system. It proved a success from the start, and the increasing business of the company demands this additional rolling stock. Each locomotive will be equipped with four motors, of an aggregate capacity of 1000 hp.

## Power Plant Equipment.

At a meeting of the citizens of Clay City, Ind., August 8, the town council was instructed to offer a franchise for an electric light plant, to take the place of the one destroyed by fire in May.

An electric street car line with a trackage of two miles is to be constructed during the present season in El Reno, Okla. The company building this system is capitalized at \$100,000 and has been granted a charter for an interurban line 50 miles in length connecting the cities of El Reno and Oklahoma City. The construction of the interurban portion of the system will not be begun until next year. The general offices of the company are at El Reno. The incorporators are John Mansy, H. Schoefer and Henry Dittman of El Reno, and J. W. Mansy of Oklahoma City.

## Foundries.

The Engineers' Supplies & Brass Foundry Company has been organized at South Bend, Ind., and capitalized at \$25,000. The directors are E. P. Baum, C. T. White, S. A. Knoblock, E. J. Clark and C. M. Kriegbaum. The officers have not yet been elected.

The Advance Radiator Company has been organized at Syracuse, Ind., and capitalized at \$60,000, to manufacture radiators, boilers and do a general foundry and machine shop business. The company has the following officers: President, Timothy Holland; secretary, Chas. B. Bentley; treasurer, Silas L. Kettling; superintendent, Carey Wright. Other directors are Lewis A. Neff, Elmer E. Strieby and B. I. Holland. The company acquires the plant of the Reynolds Heater Company at Warsaw, Ind., which will continue in operation there until the completion of the buildings at Syracuse, when the machinery will be moved there. The buildings will be of cement and steel, with cement floors.

The charter of the Anderson Foundry & Machine Works, Anderson, Ind., granted by the State for 30 years, recently expired, and an extension has been obtained for 20 years. According to Indiana law 50 years is the limit of existence for one corporation, a new incorporation being required after that time. This year the company has built an additional machine shop and made an extension to the foundry. It is at present erecting another brick and stone building, 60 x 140 ft., to be used as a pattern shop. Plans are ready for rebuilding, of brick and stone, an old frame structure, and this will give additional machine shop capacity. The plant is now run exclusively by electric current, using power from the municipal plant. Since the present management took hold of the plant, in 1889, the size has been increased about four times. The continued enlargement now is caused by steadily increasing business. The company manufactures clay working machinery, such as brick presses, pulverizers, conveyors and elevators for making brick by the dry press process; also soft mud brick machinery and equipment, tube mills, sand dryers, steel and iron brick cars, presses for making brick of sand and lime, as well as machinery for making drain tile. The company also does job foundry work and makes dump cars, trucks, barrows, &c., for brick yard equipments. The officers are: President, W. T. Durbin; vice-president, W. C. Vanneeman; secretary-treasurer, W. N. Durbin. The capital stock, \$50,000, is owned by them and a fourth director, M. C. Norton.

The South Side Steel & Malleable Casting Company, Milwaukee, Wis., now occupies its recent plant extensions, consisting of a foundry building 76 x 260 ft., and a shipping and storage building, 60 x 80 ft., both of which are of frame and concrete construction. A new melting furnace and an annealing oven have been installed in the foundry room. The output of the plant has been practically doubled.

At the recent annual meeting of the stockholders of the Sharon Foundry Company, Sharon, Pa., it was decided to add another open hearth steel furnace, and also make considerable other additions to the plant. The business of this company in the manufacture of open hearth steel castings is constantly increasing, making additions to capacity absolutely imperative. W. W. Shilling was re-elected president and Thomas Kennedy secretary, treasurer and superintendent.

The Reliance Steel Foundry Company has purchased the steel casting plant of the Cooper-Wigand-Cooke Company, located at Delawanna, N. J., which it is now re-equipping to produce 1000 tons of castings monthly by the acid open hearth process. The class of work which will be done includes miscellaneous machinery, locomotive and marine castings, ranging from 25 lb. to 20 tons. The first shipment of finished castings will, it is expected, be made early in October. S. A. Watson is president; W. F. Watson, formerly connected with the American Steel Foundries, vice president, and Arthur Falkenau, treasurer.

## Fires.

The plant of F. Westfahl & Co., manufacturers of files, at Milwaukee, Wis., was damaged by fire last week, the loss estimated being between \$30,000 and \$40,000. The company will occupy temporary quarters, but will begin at once the construction of a new and modern plant on the old site at Cherry and Thirty-first streets.

The carriage factory of Keyes Brothers, Council Bluffs, Iowa, was burned August 1, loss being about \$50,000.

The Bollman-Wilson Foundry, Front street between Pike and Lawrence, Cincinnati, was damaged by fire August 7. The fire was controlled before spreading from the pattern room to other departments. The loss on patterns will be close to \$25,000 and on the building \$8000, covered by insurance. Business will not be interrupted.

The Woodmen Stove Company's building at Alden, Ill., was recently destroyed by fire, entailing a loss of \$3500.

## Hardware.

The Sisley Stove & Queensware Company, Springfield, Mo., manufacturer of Happy Home cook stoves and jobber and importer of queensware, tin and stamped ware, has sold the property now occupied by its foundry and warehouse to the

Missouri Pacific Railway. The company will not vacate the premises until the end of the year. Plans for the future location of the plant and business have not yet been worked out, but assurance has been given that the industry will remain in Springfield.

The Concord Axle Company, Pennacook, N. H., has completed plans for a large additional factory building, which it expects to finish and occupy before winter. The company has recently installed new machinery in both its forge and finishing departments.

The W. H. Curtis Mfg. Company, Buffalo, N. Y., manufacturer of machine screws, has purchased a site on Niagara street near the new Black Rock freight house of the New York Central Railroad, on which it will erect a factory building.

Several of the larger plants of the United States Steel Corporation have recently replaced their entire vise equipment with the high speed Pittsburgh vise, manufactured by the Pittsburgh Automatic Vise & Tool Company, Pittsburgh, Pa.

#### MISCELLANEOUS.

The Harbison-Walker Refractories Company, Pittsburgh, has received a contract for about 200,000 No. 1 fire brick, to be used in a new hot blast stove to be erected by the United Iron & Steel Company at its furnace at Leetonia, Ohio, and for an additional stove at its blast furnace at West Middlesex, Pa. The contract for the balance of the brick, which will likely aggregate 225,000 for each of the stoves, was awarded to B. F. Johnston, Lewis Block, Pittsburgh, representing the Columbia Fire Brick Company, Canton, Ohio. The West Middlesex stove will be 21 x 70 ft., and the one at Leetonia will be 21 x 85 ft.

The Special Mfg. Company, Indianapolis, Ind., manufacturer of ventilating fans, has changed its name to the Indiana Fan Company.

The St. Louis Car Company, St. Louis, Mo., builder of steam and electric railroad passenger cars, is now manufacturing automobiles. Negotiations for the sale of \$3,000,000 7 per cent. preferred stock have been successfully concluded in France. It has been arranged that upon delivery of the stock at the National Bank of America in St. Louis there will be deposited, on August 31, \$1,000,000 in the Bank of France in Paris to the credit of the company. The remainder of the stock will be transferred in like amounts in October and November. With the proceeds of this sale it is the intention of the company to retire its bond issue and reduce outstanding indebtedness. The surplus which will remain after these obligations are taken care of will afford an ample sum for the extension of the company's rapidly growing business. The entire capitalization of the company is \$6,000,000, of which one-half is preferred stock and one-half common.

The reduction plant of the Golden Cycle Mining Company, at Colorado Springs, Colo., was partially destroyed by fire August 7, the loss being about \$500,000.

The capital stock of the Peerless Tank & Seat Works, Evansville, Ind., has been increased from \$100,000 to \$150,000.

The Studebaker Brothers Mfg. Company, South Bend, Ind., is erecting a four-story administration building to cost \$350,000. It is of concrete and steel with brick facing and Bedford stone trimmings. It will be 110 x 300 ft. The first two floors will be used as wholesale and retail depositaries and the remaining two floors will be used as offices. A smoking room and large library are among the things provided for the comfort of the employees.

The Kokomo Brass Works, Kokomo, Ind., has increased its capital stock from \$10,000 to \$50,000.

The Rider-Lewis Motor Car Company, recently organized at Muncie, Ind., has leased the buildings formerly occupied by the Anchor Silverware Company and expects to begin manufacturing automobiles October 1. The company has \$150,000 capital stock. It will manufacture a six-cylinder machine, designed by Ralph C. Lewis, superintendent.

The Overland Automobile Company, controlled by D. M. Parry, head of the Parry Mfg. Company, makers of buggies, Indianapolis, Ind., has outgrown its present substantial quarters, and the contract has been let for a new building, 80 x 304 ft. One of the products of the company is a noiseless gasoline buggy, weighing 1600 lb., with a four-cylinder 20-hp. engine.

The Jones & Laughlin Steel Company has let a contract for the erection of a nine-story office building at Third avenue and Ross street, Pittsburgh. It will be of steel frame, stone and brick construction, and will be occupied entirely as offices of the company.

The Creole, the first commercial vessel propelled by Curtis turbines, began her maiden trip from New York to New Orleans at noon on Saturday, July 13, 1907, and completed the first round voyage by again reaching New York on Thursday, July 25.

#### Steam Turbine Wear.

After being in operation about a year, one of the steam turbines of the Gould street power station of the Baltimore Electric Power Company was opened up, the *Engineering Record* reports, and its general condition found to be as good as when the unit was first installed. No fractures, warping, misalignment or other evidences of undue stresses were visible, nor was there any deterioration of the steam surface of the cylinder or spindle, in spite of the heavy loads carried. The turbines (three of them were installed at first, but another was later found necessary) were simply set upon their foundations, without developing any necessity for anchoring by bolts, or in any other way.

Although saturated steam had been used, the blading was in excellent condition, no blades being missing from either the spindle or the casing. No evidence of erosion from entrained water was visible, both edges of the blades and the steam surfaces being intact. From the appearance of the blade ends and that of the opposing surfaces of the spindle and the cylinder barrel, no rubbing had ever taken place. Some surface oxidation was noticeable, due, it is said, to condensed steam remaining in the cylinder while the machine was out of service. This was entirely superficial, however, and had not impaired either the smoothness or the accuracy of the blade curvature.

Neither the shaft nor the bearings showed evidence of wear. Over the entire wearing surfaces of the latter were still visible the original marks of the scraper tools, showing that the rotor was well supported on the films of oil furnished by the system of forced lubrication, and that no frictional contact took place against the opposing surface of the journal. The water packing glands developed no erosion or side wear, and effectively prevented the entrance of air into the condensing system. This is evidenced by the high vacuum maintained without excessive work from the air pumps.

Except for the replacement of a pair of inexpensive knife edges in the governing mechanism, which were but slightly worn, this portion of the outfit was in the same good condition which characterized the balance. No lost motion or other irregular working was developed, and the governing was as sensitive and positive as at first.

**More Lake Boats Ordered.**—The Toledo Shipbuilding Company has been given contracts to build two lake boats for the spring of 1908 delivery, for H. S. Wilkinson and L. C. Smith of Syracuse, N. Y. The boats will be 524 ft. over all, with 58 ft. beam, and will have a carrying capacity of about 10,000 tons each, being the largest boats ever turned out at the Toledo yard. An order for another boat has been placed with the American Shipbuilding Company. This boat will be built for Harvey L. Brown of Buffalo. It will be 524 ft. over all, and have a carrying capacity of about 9000 tons. The 9000-ton steamer ordered of the American Shipbuilding Company by W. H. Becker two weeks ago will be named for Alexis W. Thompson, who is well known in the iron and steel trade. This boat will be built at the Bay City yard.

August Heckscher, William L. Ward and J. Van Vechten Olcott, receivers of Milliken Brothers, Inc., announce through George E. Gifford, chief engineer, that they are continuing in full operation the structural and ornamental departments of the business, through the main office at 11 Broadway, New York City, and the works at Milliken, Staten Island. It is their intention to make the work of the structural shops more effective than ever. They are in a position to quote favorable deliveries on all kinds of steel and iron fabrication.

The interesting report comes from Omaha that the small rolling mill at Laramie, Wyo., now operated by the Union Pacific Railroad Company in the manufacture of bar iron for making spikes, bolts and nuts, is to be enlarged into a steel plant for rolling rails for the Harriman lines. The company has already ordered a branch line built from Laramie to a large iron ore deposit.

## The Iron and Metal Trades

Foundrymen large and small seem to persist in the policy of keeping out of the market, and even the largest melters are buying only from week to week for prompt delivery. They are encouraged in their course by constantly lower prices in some sections. In other districts, notably the South, the makers are clinging to the prices which have prevailed for a considerable time, but they are not making any sales, and in some competitive markets are dollars above the asking prices of other producers.

In Steel making Irons interest centers entirely on Basic Iron, which is weaker. Aside from one lot of 5000 tons in the East no business is reported, but it is more than probable that a buying movement in this branch of the Iron trade will set in during the next few weeks in the district east of the Allegheny Mountains.

There has been no further buying of Steel by the leading interest since last week.

While Steel works and rolling mills have assurances of full work for the balance of the year, and while they are crowded now, it is undeniable that on the whole new orders are coming in at a considerably reduced rate, so that the winter may find a slackening of operations necessary.

An interesting transaction in the Rail trade is reported from Chicago. It appears that the Santa Fé road has bought 15,000 tons from the Colorado mill and 8000 tons from Maryland, delivery to begin at once. The specifications call for a discard of 21 per cent of the ingot. Quite a good run of business has come to the Structural shops. In Chicago the contract for 8000 tons for the La Salle Hotel has been placed. Various interests have taken an aggregate of 4500 tons of Bridge work for a number of different railroads, 3500 tons for two buildings in New York, 7000 tons for extensions at the Lorain plant of the National Tube Company and 2000 tons for a training school at North Chicago. The transfer of the Pennsylvania Terminal work from the Millikens to the Carnegie Company is now formally arranged. It is of interest to note that in addition to the 20,000 tons involved 6000 to 7000 tons more have been contracted for. The deliveries are to begin at once.

The general contract for the piers in this city has been let, but the iron work which calls for about 13,000 tons is not yet in the hands of any of the mills. In 10 days additional work of the same character, calling for 8000 tons, is to be placed.

The deliveries of Galvanized Sheets are still unsatisfactory, the mills being overcrowded. In Black Sheets, however, the situation is improving. Thus far the season business in Tin Plates has been a disappointment.

There is no sign as yet that the large consumers of Copper are tempted to buy, although small lots of Electrolytic have sold at 18 cents. What they must have assurances of is that there will be a stable market at whatever price is established. It is understood that the leading consuming interest of Pig Tin has completely withdrawn from the market convinced that lower prices are justified.

## A Comparison of Prices.

Advances Over the Previous Month in Heavy Type.  
Declines in Italics.

At date, one week, one month and one year previous.

PIG IRON, Per Gross Ton : Aug. 14, Aug. 7, July 17, Aug. 15,  
1907. 1907. 1907. 1906.

Foundry No. 2, Standard, Philadelphia	\$22.00	\$22.00	\$23.00	\$18.75
Foundry No. 2, Southern, Cincinnati	23.25	23.25	23.75	17.50
Foundry No. 2, Local, Chicago	24.50	24.50	25.50	19.00
Bessemer, Pittsburgh	22.90	22.90	23.40	18.85
Gray Forge, Pittsburgh	21.90	21.90	22.90	17.85
Lake Superior Charcoal, Chicago	<b>27.50</b>	27.50	27.00	19.25

BILLETS, &c., Per Gross Ton :

Bessemer Billets, Pittsburgh	29.50	29.50	30.00	28.00
Forging Billets, Pittsburgh	<b>33.00</b>	33.00	34.00	33.00
Open Hearth Billets, Phila.	<b>31.75</b>	31.75	32.50	29.00
Wire Rods, Pittsburgh	<b>36.00</b>	36.00	36.50	34.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00

OLD MATERIAL, Per Gross Ton :

Steel Rails, Melting, Chicago	17.00	17.00	18.00	14.50
Steel Rails, Melting, Phila.	<b>17.50</b>	17.50	17.75	16.75
Iron Rails, Chicago	<b>20.75</b>	20.75	24.50	22.00
Iron Rails, Philadelphia	<b>20.50</b>	21.50	25.00	21.00
Car Wheels, Chicago	<b>24.50</b>	24.50	23.50	18.50
Car Wheels, Philadelphia	<b>23.50</b>	25.00	25.00	16.75
Heavy Steel Scrap, Pittsburgh	<b>17.75</b>	17.75	18.00	16.00
Heavy Steel Scrap, Chicago	<b>15.00</b>	15.50	16.00	14.00
Heavy Steel Scrap, Phila.	<b>17.00</b>	17.00	17.50	16.50

FINISHED IRON AND STEEL,

Per Pound :

	Cents.	Cents.	Cents.	Cents.
Refined Iron Bars, Philadelphia	1.85	1.85	1.83 $\frac{1}{4}$	1.63 $\frac{1}{4}$
Common Iron Bars, Chicago	1.78	1.78	1.78	<b>1.66<math>\frac{1}{4}</math></b>
Common Iron Bars, Pittsburgh	1.70	1.70	1.70	1.50
Steel Bars, Tidewater, New York	1.86	1.86	1.86	1.64 $\frac{1}{4}$
Steel Bars, Pittsburgh	1.60	1.60	1.60	1.50
Tank Plates, Tidewater, New York	1.86	1.86	1.86	1.74 $\frac{1}{4}$
Tank Plates, Pittsburgh	1.70	1.70	1.70	1.60
Beams, Tidewater, New York	1.86	1.86	1.86	1.84 $\frac{1}{4}$
Beams, Pittsburgh	1.70	1.70	1.70	1.70
Angles, Tidewater, New York	1.86	1.86	1.86	1.84 $\frac{1}{4}$
Angles, Pittsburgh	1.70	1.70	1.70	1.70
Skelp, Grooved Steel, Pittsburgh	1.85	1.85	1.90	1.57 $\frac{1}{4}$
Skelp, Sheared Steel, Pittsburgh	<b>1.95</b>	1.95	1.90	1.60

SHEETS, NAILS AND WIRE,

Per Pound :

	Cents.	Cents.	Cents.	Cents.
Sheets, No. 27, Pittsburgh	2.50	2.50	2.50	2.40
Wire Nails, Pittsburgh	2.00	2.00	2.00	<b>1.80</b>
Cut Nails, Pittsburgh	<b>2.10</b>	2.10	2.05	1.75
Barb Wire, Galv., Pittsburgh	2.45	2.45	2.45	2.30

METALS, Per Pound :

	Cents.	Cents.	Cents.	Cents.
Lake Copper, New York	19.00	19.50	21.50	18.62 $\frac{1}{4}$
Electrolytic Copper, New York	<b>18.00</b>	19.00	20.67 $\frac{1}{4}$	18.37 $\frac{1}{4}$
Spelter, New York	5.75	5.80	6.15	6.05
Spelter, St. Louis	5.65	5.75	6.00	5.90
Lead, New York	5.15	5.15	5.25	5.75
Lead, St. Louis	5.00	5.00	5.12 $\frac{1}{4}$	5.65
Tin, New York	36.20	38.60	40.25	41.50
Antimony, Hallett, New York	9.00	10.00	11.50	23.00
Nickel, New York	45.00	45.00	45.00	45.00
Tin Plate, 100 lb., New York	\$4.09	\$4.09	\$4.09	\$3.94

## Chicago.

FISHER BUILDING, August 12, 1907.

In common with all other commercial interests the Iron and Steel industry is suffering from the handicap imposed by the telegraphers' strike upon the transaction of business. Outside of the principal interests, which control leased wires, telephone service is relied upon for communication, and because of overburdened wires the means thus afforded is far from satisfactory. Much apprehension is felt over the possibility of a complete tie-up, which would result if operators on private wires should join the strikers. Considerable interest attaches to the Santa Fé's recent purchase of 23,000 tons of Rails because of the 21 per cent. ingot discard agreed upon, indicating, as it does, a determined purpose on the part of the railroads to secure, and the mills to produce, the best possible quality of Rails. The major part of this order, 15,000 tons, was taken by the Colorado Fuel & Iron Company, the remainder, 8000 tons, going to the Maryland Steel Company, a subsidiary corporation of the Pennsylvania Steel Company. The most notable contract of the week involving Structural Material was one for construction of the La Salle Hotel, Chicago, in which about 8000 tons will be used. Fabricating contracts on this job will not be let until plans are revised, which will require at least 30 days. Mill tonnage of Structural Shapes in specification and new business continues to increase. Aside from 1000 tons of Plates for a Montana pipe line, taken by the American Bridge Company, there are no new developments in this department. The demand in practically all lines of finished material holds up remarkably.

well, and prices are generally well maintained. Pig Iron, on the other hand, is inactive and under the pressure of continued dullness has developed further weakness. The hope of a buying movement for melters' fourth quarter requirements, which were supposed to be large, has not thus far been realized. From the scarcity of orders and inquiries for prompt Iron, the conviction is being forced that there has either been a pronounced reduction of consumption or stocks have been largely augmented by the receipt of deferred deliveries. It is probable that both causes have operated to a common end.

**Pig Iron.**—The practical suspension of buying for all deliveries makes it extremely difficult to determine the actual level of market prices. All indications, however, point to further weakness. It is becoming more and more apparent that foundry stocks are by no means depleted. In fact, there is good reason to believe that work has slackened up sufficiently to stretch the supply of Iron in melters' yards over a longer period than was anticipated. There is a decided lack of harmony in sellers' views as to the outlook. But it is very evident that on a firm inquiry for desirable tonnage prices considerably under those nominally quoted would be brought out. A few carload and small tonnage sales of Southern No. 2 have been made at \$19, Birmingham, for fourth quarter delivery, which is the nominal quotation for that period. Prompt Iron commands in any case not more than 30c. above this price. In the absence of any inquiry for round lots it cannot be said to what extent this price might be shaded, though it is certain that a strong disposition to buy would be met with important concessions. Now that premium prices for prompt delivery have practically disappeared, there is really no incentive for consumers to anticipate their wants far in advance. It is not surprising, therefore, that under present market conditions they are content to await developments. The market is barren of interest in first quarter requirements, for which no sales or inquiries are reported. Furnace interests, both North and South, adhere to the nominal quotations for first quarter of \$22, Chicago, for the former and \$18, Birmingham, for the latter, frankly admitting meanwhile that their views as to price are subject to revision should attractive tonnage be offered. More frequent rejection of delinquent shipments on contracts adds to the evidence of diminished foundry requirements and general market weakness. The following prices are for August and September delivery, f.o.b. Chicago:

Lake Superior Charcoal.	\$27.50 to \$28.00
Northern Coke Foundry, No. 1.	25.00 to 25.50
Northern Coke Foundry, No. 2.	24.50 to 25.00
Northern Coke Foundry, No. 3.	23.50 to 24.00
Northern Scotch, No. 1.	25.50 to 26.00
Ohio Strong Softeners, No. 1.	25.50 to 26.00
Ohio Strong Softeners, No. 2.	25.00 to 25.50
Southern Coke, No. 1.	24.85 to 25.35
Southern Coke, No. 2.	24.35 to 24.85
Southern Coke, No. 3.	23.85 to 24.35
Southern Coke, No. 4.	23.35 to 23.85
Southern Coke, No. 1 Soft.	25.35 to 25.85
Southern Coke, No. 2 Soft.	24.85 to 25.35
Southern Gray Forge.	21.35 to 21.85
Southern Mottled.	21.35 to 21.85
Malleable Bessemer.	24.90 to 25.40
Standard Bessemer.	25.40 to 25.90
Jackson Co. and Kentucky Silvery, 6 %	31.40 to 31.90
Jackson Co. and Kentucky Silvery, 8 %	32.40 to 32.90
Jackson Co. and Kentucky Silvery, 10 %	33.40 to 33.90

**Billets and Rods.**—The market is featureless. Mills are furnishing Billets to concerns that regularly rely on them for supply, but there is no tonnage to speak of being offered in the open market. Prices for Forging Billets continue firm, at from \$36 to \$38, Pittsburgh, for Bessemer and Open Hearth, with a demand that fully equals the supply.

**Rails and Track Supplies.**—Last week's transactions in Steam Rails include 23,000 tons purchased by the Santa Fé. Of this total, 15,000 tons were taken by the Colorado Fuel & Iron Company and 8000 tons by the Maryland Steel Company. This purchase is in addition to 20,000 tons placed by the same road with the Bethlehem Steel Company about 30 days ago. Specifications for these Rails call for a discard of 21 per cent. of the ingot. Deliveries are to begin as soon as possible and extend through the remainder of the year, and possibly into the fore part of next. The Pennsylvania Steel Company also booked an order of 500 tons of high quality Rails at \$32.10, Chicago. Further inquiries in the market for Standard Section Rails indicate an interest that will develop more business in the near future. Quite a little activity is noticed in small Rails, orders and inquiries coming from various interests which are generally anxious for prompt shipment. We quote as follows: Angle Bars, accompanying Rail orders, 1907 delivery, 1.65c.; car lots, 1.75c. to 1.85c.; Spikes, 2.20c. to 2.30c., according to delivery; Track Bolts, 2.65c. to 2.75c., base, Square Nuts, and 2.80c. to 2.90c., base, Hexagon Nuts. The store prices on Track Supplies range from 0.15c. to 0.20c. above mill prices. Light Rails, 30 to 45 lb. sections, \$34; 25-lb., \$35; 20-lb., \$36; 16-lb., \$37; 12-lb., \$38, f.o.b. mill. Standard Sections, \$28, f.o.b. mill, full freight to destination.

**Structural Material.**—The contract for the construc-

tion of the La Salle Hotel, Chicago, which involves the use of 8000 tons of Structural Material, has been let to the Geo. A. Fuller Company. On account of a revision of plans this work will not be up to the fabricators for figures for some weeks yet. Although no other contracts of notable size were closed during the past week, the inflow of orders of moderate size has not diminished, and the aggregate of tonnage is, if anything, on the increase. Figures are being taken on 524 tons for Structural work on an incline of the Northwestern Elevated Railway, which will be let August 19. The American Bridge Company is practically filled up for the remainder of the year, and it is, therefore, chiefly interested in business for next year's delivery. The railroad bridge business booked by its Chicago office for this year to August 1 amounts to 60,000 tons, which is 48,000 tons in excess of the corresponding period of last year. Prices from store are quoted without change, at 2.05c. to 2.10c., and mill prices, at Chicago, are as follows: Beams and Channels, 3 to 15 in., inclusive, 1.88c.; Angles, 3 to 6 in., 1/4-in. and heavier, 1.88c.; larger than 6 in. on one or both legs, 1.98c.; Beams, larger than 15 in., 1.98c.; Zees, 3 in. and over, 1.88c.; Tees, 3 in. and over, 1.93c., in addition to the usual extras.

**Plates.**—The Bitter Root District Irrigation Company, Hamilton, Mont., has placed a contract for a pipe line, 71 in. in diameter, composed of plates 3-16 to 5/8 in. thick, with the American Bridge Company; 1000 tons of Plates will be required for the work. But little is heard of new mill business for the reason that the local interest is not in position to take orders for delivery before the first of the year. Specifications on contracts continue to come in strongly and shipments are heavy. We quote for future delivery, as follows: Tank Plates, 1/4-in. and heavier, wider than 6 1/4 and up to 100 in. wide, inclusive, car lots, Chicago, 1.88c. to 2.08c.; 3-16 in., 1.98c. to 2.18c.; Nos. 7 and 8 gauge, 2.03c. to 2.23c.; No. 9, 2.13c. to 2.33c.; Flange quality, in widths up to 100 in., 1.98c. to 2.08c., base, for 1/4-in. and heavier, with the same advance for lighter weights; Sketch Plates, Tank quality, 1.98c. to 2.18c.; Flange quality, 2.08c. Store prices on Plates are as follows: Tank Plates, 1/4-in. and heavier, up to 72 in. wide, 2.20c. to 2.30c.; from 72 to 96 in. wide, 2.30c. to 2.40c.; 3-16 in., up to 60 in. wide, 2.30c. to 2.40c.; 72 in. wide, 2.50c. to 2.65c.; No. 8, up to 60 in. wide, 2.35c. to 2.45c.; Flange and Head quality, 0.25c. extra.

**Sheets.**—Complaints of delay in deliveries of Galvanized Sheets are not only emphatic but are well grounded; the situation in Black Sheets is somewhat better, but only relatively so. In the former, deliveries are a question of months and in the latter of weeks. We quote mill shipments as follows, Chicago: Blue Annealed, No. 10, 2.03c.; No. 12, 2.08c.; No. 14, 2.13c.; No. 16, 2.23c.; Box Annealed, Nos. 17 to 21, 2.53c.; Nos. 22 to 24, 2.58c.; Nos. 25 to 26, 2.63c.; No. 27, 2.68c.; No. 28, 2.78c.; No. 29, 2.88c.; No. 30, 2.98c.; Galvanized Sheets, Nos. 10 to 14, 2.83c.; Nos. 15 and 16, 3.03c.; Nos. 17 to 21, 3.18c.; Nos. 22 to 24, 3.33c.; Nos. 25 and 26, 3.53c.; No. 27, 3.73c.; No. 28, 3.93c.; No. 30, 4.43c. Sheets from store: Blue Annealed, No. 10, 2.40c.; No. 12, 2.45c.; No. 14, 2.50c.; No. 16, 2.60c.; Box Annealed, Nos. 18 to 21, 2.70c.; Nos. 22 to 24, 2.75c.; No. 26, 2.80c.; No. 27, 2.85c.; No. 28, 2.95c.; No. 30, 3.35c.; Galvanized, from store: Nos. 10 to 20, 3.20c. to 3.30c.; Nos. 22 to 24, 3.55c. to 3.60c.; No. 26, 3.65c. to 3.70c.; No. 27, 3.85c. to 3.95c.; No. 28, 4.15c.; No. 30, 4.65c. to 4.70c.

**Bars.**—A steady demand continues to uphold the market for Steel Bars, on which prices are firmly maintained. Iron Bars, however, are rather quiet, and the tonnage moving is comparatively small. A tendency in certain quarters to shade prices is also noted, which in a few instances has resulted in scaling quotations \$1 a ton. Quotations, Chicago, are as follows: Steel Bars, 1.78c., with half extras; Iron Bars, 1.78c.; Hoops, 2.18c., extras as per Hoop card; Bands, 1.78c., as per Bar card, half extras; Soft Steel Angles and Shapes, 1.88c., half extras. Store prices are as follows: Bar Iron, 2.10c. to 2.25c.; Steel Bars, 2c. to 2.10c.; Steel Bands, 2c., as per Bar card, half extras; Soft Steel Hoops, 2.35c. to 2.45c., full extras.

**Merchant Pipe.**—Buyers are still compelled to anticipate their wants from four to six months in advance, and notwithstanding the aggravating delinquency of shipments the demand keeps pace with the mill output. Normal delivery conditions are seemingly as far off as ever. The following mill discounts are quoted: Black Pipe, 3/4 to 6 in., 71.2; 7 to 12 in., 68.2; Galvanized, 3/4 to 6 in., 61.2. These discounts are subject to 1 point on the base. From store in small lots, Chicago jobbers quote 68 per cent. on Black Steel Pipe, 3/4 to 6 in. About 4 points advance above these prices is asked for Iron Pipe.

**Boiler Tubes.**—Scarcity of some of the leading sizes of Merchant Tubes in jobbers' stocks has resulted from the inability of the mills to make reasonably prompt shipments. Mill quotations for future delivery on the base sizes are as follows: 2 3/4 to 5 in., in carload lots, Steel Tubes, 63.2;

Iron, 50.2; Seamless, 49.2; 2½ in. and smaller, and lengths over 18 ft., and 2½ in. and larger and lengths over 22 ft., 10 per cent. extra. Store prices are as follows:

	Steel.	Iron.	Seamless.
1 to 1½ in.	35	35	35
1½ to 2¼ in.	50	35	35
2½ in.	52½	35	35
2½ to 5 in.	60	47½	47½
6 in. and larger	50	35	..

**Merchant Steel.**—Trade is almost entirely confined to routine orders, with no transactions of significant size. Quotations are as follows: Planished or Smooth Finished Tire Steel, 1.98c.; Iron Finish, up to 1½ x ½ in., 1.93c.; Iron Finish, 1½ x ½ in. and larger, 1.78c., base; Channels for solid Rubber Tires, ¾ to 1 in., 2.28c., and 1½ in. and larger, 2.18c.; Smooth Finished Machinery Steel, 2.18c.; Flat Sleigh Shoe, 1.93c.; Concave and Convex Sleigh Shoe, 2.08c.; Cutter Shoe, 2.46½c.; Toe Calk Steel, 2.33c.; Railroad Spring, 1.98c.; Crucible Tool Steel, 7½c. to 8c., and still higher prices are asked on special grades.. Shafting, 50 and 10 per cent. off in car lots, and 50 and 5 per cent. in less than car lots, base territory.

**Cast Iron Pipe.**—Business, both present and prospective, is extremely dull. No inquiries or advices of lettings involving important tonnage are reported. Expectations of lower prices in Pig Iron, which have been strengthened by recent declines, have encouraged buyers to withhold purchases. We quote per net ton, Chicago, as follows: Water Pipe, 4-in., \$38 to \$39; 6 to 12 in., \$37 to \$38; 16-in. and up, \$36 to \$37, with \$1 extra for Gas Pipe.

**Coke.**—A normal demand, with no exceptional features of interest to note, characterizes the Coke market. Seventy-two-hour Connellsville Coke is quoted at \$3 to \$3.15, at oven.

**Old Material.**—The market shows a decided tendency toward further weakness. Buyers are few and not over-anxious to purchase, even at shaded prices. It is believed that only a small part of the railroad tonnage offered last week was placed in this market, most of it being diverted to other sections and absorbed largely by consumers. It is said that the figures netted by these sales were, on the average, better than might have been expected under present market conditions. An even larger amount will be offered by the railroads this week, as shown by the following list: Baltimore & Ohio, 6700 tons; Wabash, 1126 tons; Chicago, Milwaukee & St. Paul, 1250 tons; Southern Railway, 3600 tons. A large portion of this tonnage will naturally be diverted to other markets. We quote as follows per gross ton, f.o.b. Chicago:

Old Iron Rails	\$20.75 to \$21.25
Old Steel Rails, rerolling	17.00 to 17.50
Old Steel Rails, less than 3 ft.	17.00 to 18.00
Relaying Rails, standard sections, subject to inspection	28.00 to 30.00
Old Car Wheels	24.50 to 25.00
Heavy Melting Steel Scrap	15.00 to 15.50
Frogs, Switches and Guards, cut apart	15.50 to 16.00
Mixed Steel	11.25 to 11.75

The following quotations are per net ton:

Iron Fish Plates	\$16.75 to \$17.00
Iron Car Axles	23.50 to 24.00
Steel Car Axles	20.00 to 20.50
No. 1 Railroad Wrought	14.50 to 15.00
No. 2 Railroad Wrought	13.50 to 14.00
Railway Springs	15.00 to 15.50
Locomotive Tires, smooth	17.50 to 18.00
No. 1 Dealers' Forge	12.00 to 12.50
Mixed Busheling	10.50 to 11.00
Iron Axle Turnings	10.50 to 11.00
Soft Steel Axle Turnings	10.50 to 11.00
Machine Shop Turnings	10.50 to 11.00
Cast Borings	9.00 to 9.50
Mixed Borings, &c.	9.00 to 9.50
No. 1 Mill	9.75 to 10.25
No. 2 Mill	8.75 to 9.25
No. 1 Boilers, cut to Sheets and Rings	10.50 to 11.00
No. 1 Cast Scrap	16.50 to 17.00
Stove Plate and Light Cast Scrap	14.00 to 14.50
Railroad Malleable	16.00 to 16.50
Agricultural Malleable	14.75 to 15.25
Pipe and Flues	11.50 to 12.00

**Metals.**—The concessions so far offered to consumers of Copper have failed to arouse the interest that was expected. Hand to mouth buying still continues, and will probably be practiced until users are satisfied the bottom has been reached. Sheet Zinc prices are again reduced, and quotations are revised. Old Metals are likewise weaker. We quote as follows: Casting Copper, 21½c. to 22c.; Lake, 22½c. to 22¾c., in car lots for prompt shipment; small lots, ¼c. to ½c. higher; Pig Tin, car lots, 42½c.; small lots, 43½c.; Lead, Desilverized, 5.75c. to 5.85c. for 50-ton lots; Corrodin, 6.50c. to 6.60c., for 50-ton lots; in car lots, 2½c. per 100 lb. higher; Spelter, 6.10c.; Cookson's Antimony, 16c., and other grades, 15c. to 15½c.; Sheet Zinc is \$8.10 list, f.o.b. La Salle, in car lots of 600-lb. casks. On Old Metals we quote: Copper Wire, 19c.; Heavy Copper, 18c.; Copper Bottoms, 16½c.; Copper Clips, 17½c.; Red Brass, 16½c.; Red Brass Borings, 14c.; Yellow Brass, 14c.; Yellow Brass Borings, 12c.; Light Brass, 10c.; Lead Pipe, 4½c.; Tea Lead, 4.15c.; Zinc, 4½c.; Pewter, No. 1, 29½c.; Tin Foil, 34c.; Block Tin Pipe, 37c.

## Philadelphia.

PHILADELPHIA, PA., August 13, 1907.

The market for Iron and Steel during the past week has been the dullest of the entire year. Sales have been extremely light, and some large lots that were confidently expected to have been closed have been postponed for further consideration. Prices are, of course, a shade lower, but present quotations are of no great significance, as they merely represent purchases which had to be made to cover early requirements. Buying for forward delivery is completely in abeyance, so that it is hard to say what prices will be made in case proposals for business in good volume are presented. Conditions of this kind must necessarily arise in the near future, and it is believed that by the end of the month a considerable tonnage will be arranged for. Some of the large consuming interests are beginning to feel a little more hopeful in regard to the future, and while they are not making bids it is quite likely that some would take hold freely in case buying became anything like active. It is a peculiarity of the trade that when two or three important concerns begin buying others are likely to fall in line, following out the method recently in force, in which buying has been practically suspended. The trade is, in fact, willing to admit that any movement, be it toward higher or lower figures, is always carried to extremes. This cannot continue indefinitely, however, and by the end of the month it is extremely probable that there will be market enough to establish some kind of quotations, which is hardly the case at the present time.

**Pig Iron.**—As we have already said, the past week has been notable for its dullness. The amount of Pig Iron changing hands is so small as to be very little criterion of what prices may be when the next buying movement commences. The immediate condition of the market is unquestionably weak and unsatisfactory, and the chances of any marked recovery are not seriously considered at the present time. Whether prices will go much lower or not is by no means clear. All the Iron that the furnaces are making is promptly taken and from present appearances it would seem that when their present contracts expire there will be enough demand to prevent anything like a serious change in prices. Makers of Pig Iron are, however, willing to meet buyers in a liberal spirit, but until the latter are prepared to make bids it is hardly worth suggesting a new basis of prices, although if offers came at something like \$1 per ton from to-day's figures there is not much doubt that a great deal of business would be accepted. For the present sales are in small lots at about the following prices for deliveries in buyers' yards in eastern Pennsylvania and adjoining territory:

No. 2 X Foundry	\$22.00 to \$22.50
Gray Forge	19.00 to 20.75
Basic	21.00 to 21.50
Low Phosphorus	27.50 to 28.00

**Ferroalloys.**—There is nothing doing in this market and prices of Ferromanganese are nominal, at the figures quoted last week—namely, \$60 to \$61 for shipments during the last quarter and \$62 to \$63 for August and September.

**Steel.**—The market is not specially active, although there is a fair demand in lots of a few hundred to 1000 tons each, for which \$31.75 to \$32.75 is obtained for nearby deliveries of ordinary Rolling Steel and \$35 to \$37 for Forging Steel.

**Plates.**—The demand for Plates is fully maintained and mills have no difficulty in running almost to full capacity. There is a fair amount of new business coming in, while specifications on former orders are extremely satisfactory. Prices continue as recently quoted—namely:

	Carload.	Part carload.
	Cents.	Cents.
Tank, Bridge and Boat Steel	1.85	1.90
Flange or Boiler Steel	1.95	2.05
Marine	2.20	2.25
Locomotive Firebox Steel	2.40	2.45
The above are base prices for ¼-in. and heavier. The following extras apply:		
3-16-in. thick		100 lb.
Nos. 7 and 8, B. W. G.		10
No. 9, B. W. G.		15
Plates over 100 to 110 in.		25
Plates over 110 to 115 in.		45
Plates over 115 to 120 in.		55
Plates over 120 to 125 in.		65
Plates over 125 to 130 in.		75
Plates over 130 in.		85

**Structural Material.**—Business is a little quiet locally, although the mills have enough to keep them fairly well employed. Large tonnages of this class of material, however, are handled more directly from New York and Pittsburgh than from Philadelphia, so that this market is in some sense almost a negligible quantity. Prices remain unchanged, at 1.85c. to 2c., according to specification.

**Bars.**—While new orders are of no great importance there is enough doing to enable manufacturers to run moderately full at about 1.85c. for the best Refined Iron. Ordinary qualities can be obtained at a lower figure, but

there appears to be a good deal of firmness in the best qualities. Steel Bars for prompt shipment are quoted at about the same price as Refined Iron, and something lower for late deliveries.

**Sheets.**—The demand is well maintained. At no time during the year have the mills been short of work. Prospects are favorable for the continuance of these conditions, so that prices are steady at about the following figures for mill shipments and a tenth higher for small lots: Nos. 18 to 20, 2.80c.; Nos. 22 to 24, 2.90c.; Nos. 25 to 26, 3c.; No. 27, 3.10c., and No. 28, 3.20c.

**Old Material.**—Prices are very weak and consumers seem to have no disposition to place orders even at the low figures now ruling. After such a decline, however, there should be some recovery soon, and with anything like an active demand for Pig Iron prices of Scrap will, no doubt, be influenced accordingly. Bids and offers for deliveries in buyers' yards are about as follows, with sales of good sized lots of Steel at the inside figure:

No. 1 Steel Scrap	\$17.00 to \$17.50
Low Phosphorus	22.50 to 23.00
Old Steel Axles	20.00 to 20.50
Old Iron Axles	28.00 to 29.00
Old Iron Rails	20.50 to 21.00
Old Car Wheels	23.50 to 24.00
Choice No. 1 R. R. Wrought	18.00 to 18.50
Machinery Castings	18.50 to 19.00
Wrought Iron Pipe	14.50 to 15.00
No. 1 Forge Fire Scrap	15.00 to 15.50
Wrought Turnings	14.00 to 14.50
Stove Plate	14.50 to 15.00
Cast Borings	13.00 to 13.50
Grate Bars	14.50 to 15.00

## Pittsburgh.

PARK BUILDING, August 13, 1907.

Developments of the past week or ten days, particularly in Wall Street, together with the hostile attitude of legislatures toward large corporations, are having the effect of causing a good deal of uneasiness and there is more or less apprehension as to the future. The Steel trade is quiet, the lull which started with Pig Iron and other raw materials now being felt in Finished lines. New business in all kinds of Finished Iron and Steel shows a falling off, and shipments by the mills on practically all lines are now, and have been for some time, in excess of orders. The mills are pretty well filled for the balance of the year, and there will likely be enough work to go around in the last four months, but at the same time it is a fact that few contracts for delivery ahead are being placed, buyers giving orders only for actual wants, and not anticipating future requirements as they did some time ago. The falling off is particularly noticeable in Tin Plate, the mills having practically no tonnage on their books for the last quarter. The Structural trade has quieted down, and the demand for Plates, Steel Bars, and Pipe has shown a decided falling off. There is an active demand for Furnace Coke, but Scrap is dull and neglected and prices are weak. It is believed that a buying movement in Rails will commence early in the fall, and if this should come it would probably have the effect of stimulating the demand for other Iron and Steel products, particularly those used by railroads. General conditions all over the country are good, and with normal crops conditions ought to show an improvement in September or October. Money is tight and the general report is that collections are slow.

**Pig Iron.**—The Pig Iron market is practically stagnant, as far as sales are concerned, and while prices are not absolutely lower, the tone of the market is decidedly weak. The furnaces making Bessemer Iron are pretty well sold up and consumers are specifying freely, so that there is no Bessemer Iron pressing the market to find buyers, and prices are firm. There is an over supply of Basic Iron with very little demand for it, and prices are weak, a sale of 2000 tons being reported for last four months' delivery, on the basis of \$21, Valley furnace, or \$21.90, Pittsburgh. Foundries report a large falling off in the amount of new work, and as a natural result, they are not taking out Iron as promptly as they did some time ago, and there is more or less pressure to sell, which is causing some weakness in prices. Large consumers have decided to buy only as their actual wants require, and there are no inquiries in the market for large lots for future delivery. We quote Bessemer Iron in small lots at \$22.25 to \$22.50, Valley furnace, but on large lots for future delivery, \$22 could be done. Basic Iron is weak, at \$21, at furnace, and on a firm offer, this price might be shaded. No. 2 Foundry Iron for prompt delivery is held at \$22 to \$22.50, while lower prices are being quoted for forward delivery. We quote Northern Forge Iron at nominally \$21, Valley furnace, or \$21.90, Pittsburgh.

**Steel.**—Consumers of Billets and Sheet and Tin Bars are pretty well covered by contracts, and while there is a scarcity of Steel, the mills are making better deliveries than for some time. We quote Bessemer Billets at \$29.50 to \$30, and Open Hearth, \$31.50 to \$32, Pittsburgh. Forg-

ing Billets are \$33 to \$34, Pittsburgh, while Sheet Bars are held at \$31, Pittsburgh or Youngstown mill.

**Ferromanganese.**—There is a good deal of inquiry for last quarter of the year delivery, and some tonnage has been placed on the basis of \$60 to \$61, Pittsburgh. For August and September delivery, about \$63, Pittsburgh, is quoted.

**Muck Bar.**—One leading interest, that is a regular producer of Muck Bar for the open market, sold its entire output for this year some time ago, and at very good prices. There is only a moderate demand, most consumers being covered. We quote best grades of Bar made from all Pig Iron at about \$37, Pittsburgh.

**Skelp.**—A large Pipe company has been a heavy buyer of Sheared Skelp for some time, and is taking in a much larger tonnage from outside mills, in addition to what it makes in its own plants. The mills rolling Skelp are filled up for two or three months, and Skelp for prompt delivery is scarce. We quote: Grooved Steel Skelp, 1.85c. to 1.90c.; Sheared Steel Skelp, 1.95c. to 2c.; Grooved Iron Skelp, 2.15c. to 2.20c., and Sheared Iron Skelp, 2.25c. to 2.40c., depending on sizes and widths. All these prices are f.o.b. maker's mill.

**Wire Rods.**—We note a fairly active demand for Wire Rods with the supply limited, two leading makers not having been sellers in the open market for some months. We continue to quote Bessemer Rods at \$36 to \$36.50, and Open Hearth Rods at \$37 to \$37.50, Pittsburgh.

**Steel Rails.**—It is not expected that any large contracts will be given out by leading railroads until some definite conclusion has been reached as to the sections that will best meet the requirements of the railroads using heavier rolling stock and greater speed. The demand for Light Rails is active, the Carnegie Company being pretty well filled up for the rest of this year. We quote Light Rails as follows: \$33 to \$34 for 20 to 45 lb.; \$34 to \$35 for 16-lb., and \$35 to \$36 for 12-lb., at mill. Angle Splice Bars are held at 1.65c., and Standard Section Rails at \$28, at mill.

**Plates.**—Specifications on contracts are coming in freely, and shipments by the mills continue heavy. However, the amount of new tonnage being placed is not as large as it was some time ago, but the leading Plate mills are filled up for the balance of this year. Some of the smaller mills can make reasonably prompt deliveries of Plates, for which they are sometimes able to get premiums. The new mill of the La Belle Iron Works, at Steubenville, will be ready for operation in a short time. We quote Tank Plates,  $\frac{1}{4}$ -in. thick,  $6\frac{1}{4}$  in. up to 100 in. wide, 1.70c. to 1.80c., base, at mills, Pittsburgh. Extras over this price are as follows:

	Extra per 100 lb.
Gauges lighter than $\frac{1}{4}$ -in. to and including 3-16 in.	
Plates on thin edges	\$0.10
Gauges Nos. 7 and 8	.15
Gauge No. 9	.25
Plates over 100 to 110 in.	.05
Plates over 110 to 115 in.	.10
Plates over 115 to 120 in.	.15
Plates over 120 to 125 in.	.25
Plates over 125 to 130 in.	.50
Plates over 130 in.	1.00
All sketches (excepting straight taper Plates varying in not more than 4 in. in width at ends, narrowest end being not less than 30 in.)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
"A. B. M. A." and ordinary Firebox Steel Plates	.20
Still Bottom Steel	.30
Marine Steel	.40
Shell Grade of Steel is abandoned.	

**TERMS.**—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within 10 days from date thereof, discount of  $\frac{1}{2}$  of 1 per cent. is allowable. Pacific Coast base, 1.60c., f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 in. wide down to 6 in. of Tank, Ship or Bridge quality.

**Structural Material.**—A fair amount of new work is being placed, but inquiries are not as plentiful as they were some time ago. The American Bridge Company has taken about 7000 tons for the new Open Hearth buildings of the National Tube Company, at Lorain, Ohio. The McClinton-Marshall Construction Company has taken about 1000 tons of girder work for the Baltimore & Ohio, and about 2000 tons for a Government naval training school at North Chicago. The Structural mills are from six to eight weeks' behind in deliveries, but are making better shipments than they did some time ago. We quote: Beams and Channels, up to 15 in., 1.70c.; over 15 in., 1.80c.; Angles,  $3 \times 2 \times \frac{1}{4}$  in. thick, up to 6 x 6 in., 1.70c.; 8 x 8 and 7 x  $3\frac{1}{2}$  in., 1.80c.; Zees, 3 in. and larger, 1.70c.; Tees, 3 in. and larger, 1.75c. Under the Steel Bar card Angles, Channels and Tees under 3 in. are 1.70c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

**Sheets.**—New demand for Sheets, particularly for roofing purposes, has shown a decided falling off, but at the same time the mills are filled for the next two or three months on contracts, against which buyers are specifying freely. The American Sheet & Tin Plate Company is practically filled on Sheets for the rest of this year, and is operating this week 97 per cent. of its Sheet capacity. De-

liveries on Black and Roofing Sheets are better, but the mills are still much behind on contracts for Galvanized Sheets. Prices continue firm and we quote: Blue Annealed Sheets, No. 10 gauge and heavier, 1.85c.; Nos. 11 and 12, 1.90c.; Nos. 13 and 14, 1.95c.; Nos. 15 and 16, 2.05c.; Box Annealed, Nos. 17 to 21, 2.35c.; Nos. 22 to 24, 2.40c.; Nos. 25 and 26, 2.45c.; No. 27, 2.50c.; No. 28, 2.60c.; No. 29, 2.75c.; No. 30, 2.85c. We quote Galvanized Sheets as follows: Nos. 10 and 11, 2.65c.; Nos. 12 and 14, 2.75c.; Nos. 15 and 16, 2.85c.; Nos. 17 to 21, 3c.; Nos. 22 and 24, 3.15c.; Nos. 25 and 26, 3.35c.; No. 27, 3.55c.; No. 28, 3.75c.; No. 29, 4c., and No. 30, 4.25c. We quote No. 28 gauge Painted Roofing Sheets at \$1.85 per square, and Galvanized Roofing Sheets, No. 28 gauge, \$3.25 per square, for 2-in. corrugations. These prices are for carload lots, jobbers charging the usual advances.

**Hoops and Bands.**—The new demand is quite active, while specifications on contracts placed some time ago are coming in freely. Official prices are being held and are as follows: Steel Hoops, 2c., and Bands for all purposes at 1.60c., base, half extras, as per Standard Steel card. These prices are for carload lots, f.o.b. Pittsburgh, plus full tariff rail rate to point of delivery, an advance of \$2 a ton being charged for less than carloads.

**Cotton Ties.**—Practically all the tonnage for this year has been placed, but a few small orders are being received, for which the mills are now charging 96½c. per bundle.

**Tin Plate.**—Conditions in the Tin Plate trade are not satisfactory by any means, the mills having only a moderate tonnage on their books for this and next month's delivery, and practically nothing for the last quarter. This is an unusual condition and is due largely to the lateness of the fruit crop and to the fact that it will be smaller than last year. If the hope of an average crop of tomatoes and corn is realized, it is believed that some heavy orders for Tin Plate will be placed before long by the canning interests. The American Sheet & Tin Plate Company is operating about 70 per cent. of its Tin Plate capacity, two of its largest mills having been shut down for some time, these being the Shenango Works, New Castle, containing 30 mills, and New Castle Works, also at New Castle, having 28 mills. Mechanical stokers and other improvements are being added to the Shenango Works, and repairs are also being made to the New Castle Works. We quote \$3.90 for 100-lb. Cokes, 14 x 20, f.o.b. Pittsburgh, terms 30 days, less 2 per cent. off for cash in 10 days, on which price a rebate of 5c. a box is allowed for carload and larger lots.

**Bars.**—The Conciliation Board that has been in session at Cambridge Springs, Pa., for some time, announced its award on Saturday, giving the puddlers an advance of 50c. a ton, and some of the finishers a proportionate advance. The award has not yet been formally accepted by either the Republic Iron & Steel Company or the Western Bar Iron Association, neither of these two interests having obligated itself verbally or otherwise to accept the award. The Bar Iron mills are still in operation, but effective from August 12 the scale of wages in puddling and Bar Iron mills as decided before the Board will be in force. We note a continued heavy demand for Steel Bars, and the leading mills are not catching up on back deliveries to any extent, new orders and shipments just about balancing output. We note that 1.80c. to 1.85c. is being paid by consumers of Steel Bars who want prompt deliveries. The output is not as heavy as it was some time ago, owing to the hot weather. A moderate tonnage is being placed in Iron Bars, but the mills are making better deliveries than on Steel. We quote Refined Iron Bars at 1.70c., and Steel Bars for forward delivery at 1.60c., base, half extras, f.o.b. Pittsburgh.

**Spelter.**—The demand is exceedingly dull, and prices have again shown a sharp decline. We quote prime grades of Western Spelter at 5.72½c., St. Louis, equal to 5.85c., Pittsburgh. On a firm offer, and for any considerable tonnage, it is probable this price would be shaded.

**Merchant Steel.**—There is a seasonable demand for Tire Steel, and also for other grades, but generally speaking new business is light, the mills running largely on specifications on contracts. Deliveries are fairly satisfactory, but some mills are still considerably behind in shipments. It is claimed that official prices on Steel Shafting are being held, but on the other hand there are reports that one or two makers are cutting. We quote: Smooth Finished Machinery Steel, 1.85c. to 2c., depending on quality; Flat Sleigh Shoe, 1.65c. to 1.75c.; Cutter Shoe, 2.15c. to 2.20c.; Toe Calk Steel, 2.10c. to 2.15c.; Railroad Spring Steel, 1.75c. to 1.80c.; Crucible Tool Steel, 6c. to 8c., for ordinary grades, and 10c. and upward for special grades. We quote Cold Rolled Shafting at 50 per cent. off in carloads, and 45 per cent. in less than carloads, delivered in base territory.

**Railroad Spikes.**—The demand for standard sizes is dull, and prices have shown a sharp decline. For the smaller sizes there is an active demand, and the mills are filled up with orders for some time ahead. We have reduced our prices on standard sizes of Railroad Spikes, and now quote these at \$2 to \$2.05 in large lots, and smaller sizes at \$2.30 to \$2.35 per 100 lb., f.o.b. Pittsburgh.

**Merchant Pipe.**—There is an inquiry in the market for upward of 25 miles of 12 and 16-in. line Pipe for a natural gas line for the Kansas Portland Cement Company, Iola, Kan. However, this company has bought second-hand Pipe for the greater part of the line, and may possibly buy all of it that way. The demand for Pipe continues heavy, but it is not quite as rampant as it was some time ago. Most of the leading mills are sold up for the next two or three months. Prices are firm, and are as follows:

Merchant Pipe.		Jobbers, carloads.
	Steel.	Black. Galv.
$\frac{1}{8}$ to $\frac{1}{4}$ in.	65	49
$\frac{3}{8}$ in.	67	53
$\frac{1}{2}$ in.	69	57
$\frac{3}{4}$ to 6 in.	73	63
7 to 12 in.	70	55
Extra strong, plain ends:		
$\frac{1}{8}$ to $\frac{1}{4}$ in.	58	46
$\frac{1}{2}$ to 4 in.	65	53
$\frac{3}{4}$ to 8 in.	61	49
Double extra strong, plain ends:		
$\frac{1}{2}$ to 8 in.	54	43

To the large trade all above discounts are subject to 1 point on the base and 5 per cent. on the net.

Official discounts on Iron Pipe, which are shaded one-half point or more to the large trade, are as follows, f.o.b. Pittsburgh:

Standard Genuine Iron Pipe.		Black.	Galv.
	Steel.	%	%
$\frac{3}{4}$ to 6 in.	67	57	
$\frac{1}{2}$ in.	62	50	
$\frac{5}{8}$ in.	60	42	
$\frac{1}{4}$ and $\frac{1}{4}$ in.	58	42	
7 to 12 in.	62	47	

Extra Heavy Iron Pipe, Plain Ends.		Black.	Galv.
	Steel.	%	%
$\frac{1}{8}$ , $\frac{1}{4}$ and $\frac{3}{8}$ in.	62	40	
$\frac{1}{2}$ to 4 in.	59	47	
$\frac{3}{4}$ to 8 in.	55	42	

**Boiler Tubes.**—The demand for Locomotive Tubes is only fairly active, but for Merchant Tubes is heavier. Most of the mills are filled up for the next two or three months. It is stated that discounts are being firmly held as follows:

Boiler Tubes.		Iron.	Steel.
	Steel.	%	%
1 to $1\frac{1}{2}$ in.	42	47	
$1\frac{1}{2}$ to $2\frac{1}{2}$ in.	42	59	
$2\frac{1}{2}$ in.	47	61	
$2\frac{1}{2}$ to 5 in.	52	65	
6 to 13 in.	42	59	
$2\frac{1}{2}$ in. and smaller, over 18 ft. long, 10 per cent. net extra.			
$2\frac{1}{2}$ in. and larger, over 22 ft. long, 10 per cent. net extra.			

**Coke.**—We note an active demand for Furnace Coke, blast furnaces that are being supplied by contracts all insisting on prompt shipments. There is also a good demand for Foundry Coke, but not as heavy as for Furnace. We quote best grades of Connellsburg Furnace Coke for prompt delivery at \$2.60 to \$2.65, at oven, and 72-hr. Foundry Coke, of standard grades, at \$3.15 to \$3.75. Furnace and Foundry Coke made outside of the Connellsburg region, and which runs somewhat high in sulphur, is offered at lower prices than the above. The labor supply in the Connellsburg region is better than for some time, and the output continues to break all records, the Upper and Lower Connellsburg region having made 419,025 tons of Coke last week.

**Iron and Steel Scrap.**—There is no improvement whatever in the demand for Scrap, sales being confined entirely to the actual needs of customers. The tendency of the market is toward lower values. As noted last week, there is a good deal of Scrap pressing the market for sale. We quote nominally as follows: Heavy Steel Scrap, \$17.75 to \$18, for Pittsburgh, Steubenville or Sharon delivery; No. 1 Railroad Wrought Scrap, \$17.25 to \$17.50; Rerolling Rails, \$18.25 to \$18.50; No. 2 Wrought Iron Scrap, \$17 to \$17.25; Bundled Sheet Scrap, \$15.75 to \$16; No. 1 Busheling Scrap, \$17 to \$17.25; No. 2, \$13.75 to \$14; Old Steel Rails, short pieces for Open Hearth use, \$17.75 to \$18; Low Phosphorus Melting Stock, \$22; Cast Iron Barrings, \$13.25 to \$13.50; No. 1 Cast Scrap, \$20; Grate Bars, \$15.75 to \$16; Stove Plate, \$15.75 to \$16; Steel Axles, \$22.25 to \$22.50; Old Car Wheels, \$25. All these prices are per gross ton, f.o.b. buyer's mill, Pittsburgh, unless otherwise stated.

## Cincinnati.

FIFTH AND MAIN STS., August 13, 1907.

**Pig Iron.**—No new features have developed in the situation since last week. Inquiries are, perhaps, a little better. There are three or four aggregating 1000 tons that have come forward from various sources, in addition to which is one from a Virginia Pipe maker for 1000 tons, divided equally between No. 3 Foundry and Gray Forge, delivery to be made in August and September. Prices apparently have not changed, although there has not been enough business transacted to establish quotations. How-

ever, the spot market for No. 2 Foundry is quotable at \$20 to \$20.50, Birmingham, which quotation is also applicable throughout the present month, with \$19 asked for anything offering for fourth quarter. There are a few inquiries said to have come forward for next year's business, with prices hovering around \$18. Reports indicate that consumers are again experiencing some delay in receiving the Iron due on old contracts and are urgently requesting that it be forwarded without further delay. One of the largest melters in this territory is reported to be simply covering for a week or two in advance of requirements, and to be unwilling to pile much finished product at prevailing costs. Here and there we hear of a small tonnage of resale Iron, but it is not believed there is enough of it available to cause any serious disturbance. Freight rates from the Hanging Rock District to Cincinnati are \$1.20 and from Birmingham \$3.25. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1.....	\$23.75 to \$24.25
Southern Coke, No. 2.....	23.25 to 23.75
Southern Coke, No. 3.....	22.75 to 23.25
Southern Coke, No. 4.....	22.00 to 22.50
Southern Coke, No. 1 Soft.....	23.75 to 24.25
Southern Coke, No. 2 Soft.....	23.25 to 23.75
Southern Coke, Gray Forge.....	20.75 to 21.25
Southern Coke, Mottled.....	19.75 to 20.25
Ohio Silvery, 8 per cent. Silicon.....	29.65 to 30.15
Lake Superior Coke, No. 1.....	23.65 to 24.15
Lake Superior Coke, No. 2.....	23.15 to 23.65
Lake Superior Coke, No. 3.....	22.65 to 23.15

#### Car Wheel Irons.

Standard Southern Car Wheels.....	\$29.00 to \$29.50
Lake Superior Car Wheels.....	27.50 to 28.00

**Coke.**—Considerable trade in small lots has been transacted, and prices are holding fairly strong. We quote best brands of Connellsville and Virginia Foundry \$3 to \$3.25, f.o.b. ovens.

**Finished Iron and Steel.**—The demand for Finished Material of all classes continues strong. Prices are firm and unchanged. We quote, f.o.b. Cincinnati, as follows: Iron Bars, carload lots, 1.80c., with half extras; small lots from store, 2c., with full extras. Steel Bars, carload lots, 1.75c., half extras; smaller lots from store, 1.95c., with full extras. Base Angles, carload lots, 1.85c. Beams and Channels, carload lots, 1.85c., base. Plates,  $\frac{1}{4}$ -in. and heavier, carload lots, 1.85c., base, and smaller lots from store, 2.25c. Sheets, No. 16, carload lots, 2.05c., and smaller lots from store, 2.60c.; No. 14, carload lots, 1.95c., and smaller lots from store, 2.50c. Steel Tire, 1 x  $\frac{1}{4}$  in. or heavier, 1.95c., in carload lots.

**Old Material.**—The demand for Scrap has slackened considerably. We quote dealers' prices, f.o.b. Cincinnati, as follows:

No. 1 R. R. Wrought, net ton.....	\$16.50 to \$17.00
Cast Borings, net ton.....	9.00 to 9.50
Steel Turnings, net ton.....	12.00 to 12.50
No. 1 Cast Scrap, net ton.....	17.50 to 18.00
Old Iron Axles, net ton.....	25.50 to 26.00
Old Iron Rails, gross ton.....	24.00 to 24.50
Old Steel Rails, long, gross ton.....	17.50 to 18.00
Relying Rails, 56 lb. and up, gross ton.....	27.50 to 28.00
Old Car Wheels, gross ton.....	24.00 to 24.50
Low Phosphorus Scrap, gross ton.....	19.50 to 20.00

## Cleveland.

CLEVELAND, OHIO, August 13, 1907.

The movement of Ore from the ports at the head of Lake Superior that were tied up by the Ore handlers' strike is increasing, and the receipts at Lake Erie ports have been heavy the past two or three days. The August shipments, however, will be far below those of the record breaking month of June. While a few of the mines are sending Ore forward as fast as they did before the strike, many Minnesota mines are working with short crews. Receipts of Ore at the ports at the head of the lakes are not heavy enough to take care of the boats as fast as they arrive, so that there is considerable delay in getting cargoes. Some of the Lake Superior boats have been shifted to Escanaba, and as a result boats have been more plentiful at that port than cargoes. Ore shipments during the last half of the month will have to show considerable increase to bring the total movement to that of August of last year. Nearly all the Ore that is being brought down now is being sent directly to the furnaces, very little being piled on the docks. The Ore market is quiet, but prices are very firm. There is an occasional sale of a small tonnage of Ore, but shippers are not asking premiums. Prices are as follows, at Lake Erie docks, per gross ton: Old Range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old Range non-Bessemer, \$4.25; Mesaba non-Bessemer, \$4; Siliceous Bessemer, \$2.75; Siliceous non-Bessemer, \$2.35 to \$2.60.

**Pig Iron.**—A little more activity has been shown in inquiries during the past day or two. The buying in small lots has about cleaned up all the spot Iron for the present, and Foundry Iron for immediate shipment is scarcer in this district than it was a few weeks ago. Foundries are pretty well covered for their immediate needs, however. Prices are unchanged, but appear slightly firmer. Inquiries have just

come into the market for several thousand tons of Iron for September and October delivery, and it is estimated that quite a tonnage will be needed before the end of the year. Some sales of No. 2 Foundry were made in small lots during the week at \$23, Valley furnace, for prompt shipment, and for the balance of the year. We quote No. 2 Northern Foundry Iron at \$23, Valley furnace, for the balance of the year, although it is possible that a little lower price might be secured. Some of the furnaces that are sold up to their limit are having trouble in keeping up on deliveries, as they are not turning out their usual amount of Iron. While this is due partly to the hot weather, some of the furnacemen claim that the restricted output is due to the inferior quality of the Ore. Foundries are not rushed as they were a few months ago, and while some are urging prompt shipments of Iron under contract others are asking shipments held back. There are no inquiries for Foundry Iron for next year's delivery. Furnaces are holding the minimum price at \$21.50 for No. 2 Foundry for the first quarter and first half of 1908, but are making no efforts to make sales. There is an occasional inquiry for Southern Iron for next year, and the sale of a small tonnage is noted at \$19, Birmingham, for No. 1 for first quarter delivery. Quotations for the fourth quarter of 1907, f.o.b. Cleveland, are as follows:

Bessemer .....	\$23.40
Northern Foundry, No. 1 .....	23.50
Northern Foundry, No. 2 .....	23.00
Northern Foundry, No. 3 .....	22.50
Gray Forge .....	22.00

**Coke.**—The demand continues good and prices are firm. Some producers are pretty well sold out for the year. Connellsville 72-hr. Foundry Coke is quoted at \$3.15 to \$3.25, at oven, although as high as \$3.50 is asked. Furnace Coke is quoted at \$2.60 to \$2.75, at oven. Spot Furnace Coke is scarce, and one sale is noted at \$2.85, at oven.

**Finished Iron and Steel.**—Specifications have come in heavily during the past week, particularly on Plate and Structural and Steel Bar contracts. A number of agricultural implement makers have come in the market with good sized specifications for Steel Bars and Agricultural Shapes, and large Structural specifications have been received from shipbuilding companies. The Bolt and Nut manufacturers have also specified heavily on Bars, and local Structural shops have put in good sized orders for Structural Material and Plates. Local Structural shops have a large amount of work on hand, and the stocks of some of them are running rather low. While the railroads are not doing much in the bridge building line, there is a large amount of other bridge work in this territory that will require a great deal of Structural Material. The heavy specifications are keeping the mills well filled up, so that they are making no improvement on deliveries. Some of the Plate and Structural mills that have been taking orders for late in the year are now entirely filled up for 1907. A fair amount of new business for this time of the year has been placed on the books during the week, it being mostly in small orders. A local Structural shop placed an order for about 500 tons of Bars and Shapes. Contracts are pending, and will probably be closed this week for 1800 tons of Rails for a traction line, and for about 3000 tons of Plates and Shapes for another lake freighter to be built by the American Shipbuilding Company. There is a fair amount of new business in Iron and Steel Bars. No improvement is noted in Steel Bar deliveries, but some of the larger mills can make a little better shipment in Iron Bars. We quote Iron Bars at 1.70c. to 1.75c., Cleveland, for carload lots. Local mills quote Iron Bars at 1.65c., Cleveland, for Western trade. We quote Steel Bars at 1.70c., Cleveland, with half extras, for future delivery in carload lots. There is a fair demand for Plates for prompt delivery at a premium of \$2 a ton. Outside of Plates no premium business is being done. There is an inquiry in the local market for 3000 to 4000 tons of Plates for a boiler shop, for delivery up to the close of the year. While larger mills are well filled up, some of the smaller mills can ship Structural Material in about 60 days. We quote Beams and Channels at 1.80c., base, Cleveland, for carload lots. We quote Plates,  $\frac{1}{4}$ -in. and heavier, carload lots, 1.80c., base, Cleveland. Warehouse business is good in all lines. No change is noted in stock prices. We quote Steel Bars out of stock at 1.95c., and Iron Bars at 2c. Warehouse prices on Sheets are as follows: Blue Annealed, No. 10, 2.30c.; No. 28 One Pass Cold Rolled, 3.05c.; No. 28 Galvanized, 4.05c. We quote Beams and Channels out of stock at 2.25c., base. The warehouse price on Boiler Tubes, 2 $\frac{1}{4}$  to 5 in. is 64 per cent. discount, and on Black Merchant Iron Pipe, base sizes, 67 per cent. discount.

**Old Material.**—The weak market that has existed for some time was followed by a further decline in prices during the past week. The little buying that has been going on for some time to supply immediate needs has entirely ceased, and the market could scarcely be duller than it is at present. Not only are the mills not buying, but some of them are said to be taking advantage of their contracts, and are not accepting material that is not delivered promptly according to the terms of their contracts. This is material that was

contracted for at prices higher than those now prevailing. Other mills are asking dealers to hold back on shipments of Old Material. Owing to the few transactions the price on many grades of Scrap is hard to determine. Dealers are holding off, and will buy very little until conditions improve. The Baltimore & Ohio Railroad is out with a list of about 1500 tons. Dealers' prices to the trade, per gross ton, f.o.b. Cleveland, are as follows:

Old Steel Rails.....	\$16.50 to \$16.75
Old Iron Rails.....	22.00 to 22.50
Steel Car Axles.....	21.50 to 22.00
Old Car Wheels.....	23.00 to 24.00
Relaying Rails, 50 lb. and over.....	27.50 to 28.00
Relaying Rails, under 50 lb.....	30.00 to 31.00
Heavy Melting Steel.....	16.00 to 16.50
Railroad Malleable.....	17.75 to 18.25
Agricultural Malleable.....	15.50
Light Bundled Sheet Scrap.....	13.50 to 14.00

The following quotations are per net ton, f.o.b. Cleveland:

Iron Car Axles.....	\$26.00 to \$27.00
Cast Borlings.....	10.50 to 11.00
Iron and Steel Turnings and Drillings.....	12.00 to 12.75
Steel Axle Turnings.....	14.00 to 15.00
No. 1 Busheling.....	14.50 to 15.00
No. 1 Railroad Wrought.....	16.00 to 16.50
No. 1 Cast.....	18.00 to 19.00
Stove Plate.....	14.50 to 15.00
Bundled Tin Scrap.....	10.00

### Birmingham.

BIRMINGHAM, ALA., August 12, 1907.

**Pig Iron.**—The market is without change since last week, except that it is more quiet, if possible. The only business transacted has been on single car lots for immediate shipment and these have been less numerous than usual. All the furnaces continue to work badly, the percentage of high grade Foundry Iron being produced at this time running far below normal, as a result of which shipments on contracts are being much delayed. Representatives of some of the largest melters in the country have been in the district during the past week urging deliveries. This is the most encouraging feature of the whole situation, as so long as the melters are clamoring for the Iron there is not much chance for any considerable concession in price. On the other hand, it is known that many of the foundries have fewer orders on their books than for months, and, while all are now operating to their full capacity, the prospects for the future are not nearly so bright as they have been and it is not expected that consumption will keep up to the record which has been established. Prices for the balance of the year are getting very close to spot Iron, which has ceased to command any premium. Quotations made during the past week were about as follows: August and September shipment \$20 to \$21, last quarter \$19 to \$20. In some instances delivery during the last four months of the year was quoted on the same basis as the last quarter, and where any quantity of the lower grades is desired an attractive differential can be secured. For the first quarter of next year \$18.50 is still being quoted. This quotation does not receive the serious consideration of buyers, and as the price, even though it were much lower, would probably not tempt the melters to place orders at this time, the furnace people figure they might just as well maintain it as a lower one. Production will probably gradually increase during each remaining month of the year in this district, as several of the furnaces now undergoing repairs will be ready for the torch within a short time.

The No. 2 furnace of the Tennessee Coal, Iron & Railroad Company at Bessemer was blown in during the week after having been out undergoing repairs for nearly a year. Many improvements have been made and its producing capacity has been increased.

**Cast Iron Pipe.**—The Pipe market is more quiet than it has been for a long time. As a usual thing, even in the dullest times, there is a good demand for Water and Gas Pipe, as municipalities as a rule can always float bonds for this kind of work, but high priced money is now making itself felt, and many improvements have been deferred until such time as conditions adjust themselves normally. This applies more particularly to places requiring large tonnage and has had no influence on the small orders which are constantly received. Fortunately these small orders are sufficient to keep order books in fairly good condition. Prices on Water Pipe remain unchanged and are about as follows per net ton, f.o.b. cars: 4 to 6 in., \$34 to \$35; 8 to 12 in., \$33 to \$34; over 12 in. average \$31, with \$1 per ton extra for Gas Pipe.

**Old Material.**—Little change is reported in the Scrap market. There is possibly less demand for Heavy Cast, as there is little economy in using it with the present prices on the lower grades of Foundry Iron, but on Stove Plate and Light Cast the demand continues to exceed the supply. The demand for Wrought is limited and very little is moving. Steel is holding its own remarkably well. Dealers' quotations are approximately as follows per gross ton, f.o.b. cars here:

Old Iron Rails.....	\$22.00 to \$22.50
Old Iron Axles.....	18.50 to 19.00
Old Steel Axles.....	17.00 to 17.50
Old Car Wheels.....	20.50 to 21.00
No. 1 Railroad Wrought.....	18.00 to 18.50
No. 2 Railroad Wrought.....	13.00 to 13.50
No. 1 Country Wrought.....	13.50 to 14.00
No. 2 Country Wrought.....	12.00 to 12.50
Wrought Pipe and Flues.....	13.00 to 13.50
Railroad Malleable.....	14.00 to 14.50
No. 1 Steel.....	14.50 to 15.00
No. 1 Machinery Cast.....	16.00 to 16.50
Stove Plate and Light Cast.....	13.00 to 13.50
Cast Borlings.....	8.50 to 9.00

### New York.

NEW YORK, August 14, 1907.

**Pig Iron.**—There have been a number of sales of 1000-ton lots of Foundry Iron, and one block of 5000 tons of Basic Pig. Prices are easier, but the feeling is gaining ground that they are becoming more tempting to buyers, and that notably in Basic Pig a buying movement may not be far off. We quote for Northern Irons, at tidewater, \$22 to \$22.50 for No. 1 Foundry, \$21 to \$21.50 for No. 2 Foundry and \$20 to \$20.50 for No. 2 Plain. Southern Iron is nominally \$24.50 to \$25 for No. 2.

**Steel Rails.**—The orders of the week have been confined to small lots and conditions are not expected to change before early fall at least. The meeting between railroad and Steel works representatives is expected to take place next month. The Hudson Companies is in the market for 1000 tons for its tunnels.

**Structural Material.**—Railroad bridge work has been a feature in the past week, a number of roads closing for work that must be put through this year. The largest of the late contracts in this line, 1200 tons for the Baltimore & Ohio, was taken by the McClintic-Marshall Construction Company. The Erie let 400 tons, the Lake Shore 800 tons, the Burlington 800 tons, the Rock Island 400 tons, the Minneapolis & St. Louis 500 tons, and the New Haven made a further addition to its long list of orders. In connection with the formal award of the Steel for the Pennsylvania terminal to the American Bridge Company, after the surrender of the original contract by the Milliken receivers, it is stated that additions have been made to the requirements of 20,000 tons, originally figured on, and 26,000 to 27,000 tons of Steel will probably be furnished by the new contractors. Deliveries will be completed within 9 or 10 months. For the new blast furnace and other construction at the plant of the National Tube Company, Lorain, Ohio, 7000 tons of Steel was awarded the American Bridge Company. The latter also has the contract for 4000 tons for the Carnegie Steel Company, most of which will go into the new building on the old Consolidated Exchange site and the new Lawyers' Title Insurance & Trust Company Building on Broadway. The general contract for piers 57 to 59 and pier sheds of the new Chelsea improvement was let this week to R. P. & J. H. Staats. It will require 13,000 tons of Steel, the destination of which has not been announced. In 10 days a third letting on the same work is expected, requiring about 8000 tons. Some municipal pier work will be done in Brooklyn a little later. The amount of business current in structural lines is regarded as quite satisfactory and curtailment due to money conditions is not a factor as yet. The mills are quite behind their order books and see no likelihood of early slackening. In the past week an Eastern fabricating company that has rolled its own Steel until recently entered the market for a moderate tonnage. We quote tidewater deliveries, mill shipments, as follows: Beams, Channels, Angles and Zees, 1.86c.; Tees, 1.90c.; Bulb Angles and Deck Beams, 2c. On Beams 18 to 24 in. and Angles over 6 in. the extra is 0.10c. Sales are made out of stock, of material cut to length, at 2 1/4c. to 2 1/2c.

**Bars.**—Business in Bar Iron has shown further improvement. Sales are somewhat larger, indicating that dealers and consumers have been obliged by their necessities to enter the market. The position of Bar Iron manufacturers has been benefited by the decline in Pig Iron and Scrap, which has not been accompanied by a corresponding fall in the price of the finished product. Their cost of production had previously been painfully close to the selling price. Prices of Best Refined are maintained on the basis of 1.60c. to 1.65c., Pittsburgh, or 1.76c. to 1.81c., tidewater. Steel Bars continue to be quoted at 1.76c., tidewater, for future delivery, but for early shipment buyers are paying 1.86c., or higher.

**Plates.**—While the local demand for Sheared Plates shows little improvement, Universal Plates continue in good request, and mills are steadily falling behind in deliveries. Quotations are firmly held as follows for tidewater delivery: Sheared Tank Plates, 1.86c. to 1.96c.; Flange Plates, 1.96c. to 2.06c.; Marine Plates, 2.26c. to 2.36c.; Fire Box Plates, 2.75c. to 3.50c., according to specifications.

**Cast Iron Pipe.**—The only public letting now known to be on the market in Eastern territory is that of the city of Philadelphia, which calls for 1350 tons and on which bids

will be opened August 22. Trade in general is very quiet, with only a few buyers of small lots now in the market. It is fortunate under the circumstances that the foundries have no stocks of Pipe. Prices are therefore well maintained on the basis of \$34.50 to \$35 per net ton at tidewater on carload lots of 6 in.

**Old Material.**—The market is in rather a peculiar position. It is not very encouraging from the sellers' point of view, as the quantities now being bought by consumers are small. While prices have been weak the tonnage forced on the market has been decidedly light, as the stocks held by local dealers and storage yards are hardly 5 per cent. of what they were at the corresponding time last year. The quantities now offered by railroads are also comparatively small, and such material as is coming out is well taken care of. It is naturally difficult to predict what may happen in 30 to 60 days, but as a great many consumers have not been buying for over two months, and it is well known that the rolling mills in Eastern territory have been using up their Scrap rapidly and stocks at mills are getting low, a demand should be expected to develop in the near future. Even a slight buying movement would have a tendency to stiffen prices materially. All the Steel mills and rolling mills appear to have considerable work on their books, and it looks as if their consumption of Scrap would keep up well through most of the remainder of the year. Prices to-day are so much lower than they were two months ago that it is generally believed in the trade that bottom prices have been reached. We quote, per gross ton, f.o.b. New York, as follows:

Old Girder and T-Rails for melting	\$14.00 to \$14.50
Heavy Melting Steel Scrap	14.00 to 14.50
Old Steel Rails, rerolling lengths	16.50 to 17.00
Relaying Rails	26.00 to 26.50
Old Iron Rails	21.50 to 22.00
Standard Hammered Iron Car Axles	27.50 to 28.00
Old Steel Car Axles	19.50 to 20.00
No. 1 Railroad Wrought	17.00 to 17.50
Iron Track Scrap	15.50 to 16.00
No. 1 Yard Wrought, long	15.00 to 15.50
No. 1 Yard Wrought, short	14.50 to 15.00
Light Iron	9.00 to 9.50
Cast Borings	11.00 to 12.00
Wrought Turnings	13.00 to 13.50
Wrought Pipe	13.00 to 13.50
Old Car Wheels	22.00 to 23.00
No. 1 Heavy Cast, broken up	17.00 to 17.50
Stove Plate	14.50 to 15.00
Grate Bars	12.50 to 13.00
Malleable Cast	17.50 to 18.00

## Metal Market.

NEW YORK, August 14, 1907.

**Pig Tin.**—Rapid declines throughout the entire week have left the market in a most hopeless state, and every one in the trade is simply standing back watching it tumble of its own weight. The bull interests in London, which have supported the market for many months, seem to have grown weary and deserted the metal, and when they withdrew their support prices naturally toppled. The market in the Far East also dropped, and of course our market went to pieces in sympathy with the London decline. The demand here was so small that the premium on spot over the London market narrowed down decidedly. It is reported on excellent authority that the principal consumer in this country has decided to remain out of the market for some time. On August 7 London opened at £174 15s., and spot was sold here at 38.75c. London advanced to £175 5s. the next day, while prices here remained unchanged. London declined on the 9th to £172, and this market fell to 38.25c. On the 12th London fell to £171 10s., and New York prices dropped to 37.75c. Yesterday the London market went off to £167 10s., and our market fell to 36.95c. This morning's opening London quotation marked another decline of £2 10s., when £165 was cabled. The latter figures are equivalent to 35.87½c. in United States currency. At the close to-day London scored a further decline, naming £164 15s. for spot and £164 5s. for futures. Prices here at the close of the market to-day are as follows: Spot, 36.20c. to 36.50c.; August, 36c. to 36.35c.; September, 35.80c. to 36c.; October, 35.75c. to 35.95c. The market is very weak. Arrivals thus far this month amount to 915 tons, and the "afloats" are figured at 1940 tons. It is stated in the trade that the steamer Minneapolis sailing on Saturday from London will bring 985 tons, which will be available about August 26. Shipments from the East will be as large as last month, which means that they will amount to more than 5000 tons. All this shows that there are no indications of a scarcity of the metal here for some time to come.

**Copper.**—There is no exaggeration in the statement that the market is demoralized. The difference between the figures given to the public by selling agencies of the leading producers and the figures at which consumers can buy and are buying, though their wants are very meagre, is so great that it would be futile to name producers' alleged quotations. Transactions are of such limited proportions that a sale of 100 tons is nowadays considered a large quantity. Since our last report the London market for spot has dropped from £82 10s. to £76 10s., while futures fell from £80 15s. to £73 10s. Converting the latter figures in each case to

United States money, they show 16.50c. for spot and 15.90c. for futures. Best Selected has declined in a similar manner, reaching the lowest to-day, at £85 10s., which is equivalent to 17.75c. Closing London quotations to-day are as follows: Spot, £78; futures, £75 7s. 6d. Copper can be purchased here to-day at the following figures: Lake, 19c. to 19.50c.; Electrolytic, 18c. to 18.50c.; Casting, 17.50c. to 18c. In view of the unsettled state of the market even these prices are more or less nominal and might possibly be shaded. Exports so far this month have fallen off and amount to but 5987 tons.

**Pig Lead.**—The market is very dull, with consumers still awaiting a reduction in price by the leading producers. Considerable outside Lead is to be had at 5.15c. to 5.25c., New York, and 5c. in St. Louis. London quotes £19 12s. 6d.

**Spelter.**—A very weak market continues, with prices slightly lower than those quoted last week. Scarcely any business is offering at any price. Purchases may be made at 5.75c. to 5.80c. here, and St. Louis telegraphs free sellers at 5.65c. The London market to-day is £22 2s. 6d.

**Ferroalloys.**—The market for 50 per cent. Ferrosilicon remains firm, a good business for August delivery having been done on the basis of \$105, Baltimore, duty paid. Ferromanganese continues very dull, with prices unchanged, at \$61 to \$63, Pittsburgh.

**Tin Plate.**—There is no change. Business is only fair and prices remain at \$3.90, f.o.b. Pittsburgh, and \$4.09, f.o.b. New York, for 100-lb. I C Coke Plates.

**Antimony.**—A rather wide decline has taken place. Cookson's is now quoted 10c. to 10½c., while Hallett's has dropped to 9c. to 9½c., and other grades are now quoted from 8½c. to 8¾c. The above prices are for spot, and futures may be had at about ½c. less.

**Old Metals.**—The demand is quite light and the market has declined still further on Old Copper and Brass. Dealers' selling prices are as follows:

	Cents.
Copper, Heavy Cut and Crucible	17.50 to 18.50
Copper, Heavy and Wire	17.00 to 18.00
Copper, Light and Bottoms	16.00 to 16.50
Brass, Heavy	11.50 to 12.00
Brass, Light	9.00 to 9.50
Heavy Machine Composition	15.50 to 16.00
Clean Brass Turnings	10.00 to 11.00
Composition Turnings	13.50 to 14.00
Lead, Heavy	4.75
Lead, Tea	4.37½
Zinc Scrap	4.75

## Iron and Industrial Stocks.

NEW YORK, August 14, 1907.

The stock market has passed through a week of tribulation. The cumulative influence of the great fine imposed on the Standard Oil Company, the prospect that other industrial and railroad corporations would be similarly prosecuted and fined, the aggravation of controversies between several of the Southern States and the railroad companies operating therein, the telegraphers' strike and the scarcity of money led to heavy liquidation. Thursday of last week was a day of large transactions and rapidly declining prices, but Friday witnessed some recovery, which promised to extend further until the better feeling was reversed by announcements of further indictments against the Standard Oil Company and railroad companies in western New York. This led to furious liquidation on Saturday, and this week the demoralization continued until Tuesday afternoon, when some recovery set in. During this time of sacrifice of securities by frightened holders the banking interests and heavy capitalists apparently made no attempt to stay the decline, but from time to time simply purchased for the purpose of preventing the demoralization from running into actual panic. The extent of the decline in prices from the highest point on Thursday or Friday to the lowest point realized on Monday or Tuesday is shown in the following figures: United States Steel common fell from 33½ to 29½, preferred from 98 to 92½; Car & Foundry common from 40½ to 36½, preferred from 100 to 98; Locomotive common from 56 to 50, ex-dividend, preferred from 104½ to 99½; Steel Foundries preferred from 36 to 32½; Colorado Fuel from 27½ to 22½; Pressed Steel common from 30% to 25, preferred from 89 to 87; Railway Spring common from 39 to 34, preferred from 90 to 87; Republic common from 25 to 21½, preferred from 80 to 76; Sloss-Sheffield common from 50 to 44½; Cast Iron Pipe common from 32½ to 29½, ex-dividend. Cast Iron Pipe preferred, most remarkably, advanced from 78½ to 78½, while other stocks were falling. Can preferred declined from 50% to 47%. Prices recovered sharply on Tuesday afternoon, but fell again to-day. Last transactions up to 1.30 p.m. to-day are reported at the following prices: United States Steel common 31½, preferred 93½; Car & Foundry common 38½, preferred 98½; Locomotive common 53, preferred 103; Steel Foundries common 6, preferred 33; Colorado Fuel 24½; Pressed Steel common 28, preferred 87; Railway Spring common 35; Republic common 22, preferred 77; Sloss-Sheffield common 46%; Tennessee Coal 140; Cast Iron Pipe common 30, preferred 79; Can common 47%, preferred 49.

## PERSONAL.

R. H. Wolff of New York, the representative of the Héroult process, sailed on Tuesday last for a short trip to Europe.

Frederick M. McPherson has resigned his connection with the Bird Iron Company, Culbertson, Ohio, and accepted a position as superintendent for the Embree Iron Company, Embreeville, Tenn. He was foundryman for the Embree Company before engaging with the Bird Company.

J. Cecil Nuckles, for the past three years advertising manager of the S. Obermayer Company, Cincinnati, Chicago and Pittsburgh, has recently received the additional appointment of advertising manager of the Cincinnati Electrical Tool Company.

F. D. Laughlin, formerly vice-president of the Atlantic Brass Company, has been appointed Eastern sales manager of the Pittsburgh Pneumatic Company, Canton, Ohio, manufacturer of pneumatic tools, with headquarters at 90 West street, New York City, succeeding Glenn B. Harris.

Don H. Bacon, formerly chairman of the Tennessee Coal, Iron & Railroad Company, landed in New York last week after a tour around the world.

Prof. Chas. H. Benjamin, who has occupied the chair of mechanical engineering at Case School of Applied Science, Cleveland, for a number of years, has been elected dean of the schools of engineering of Purdue University, Lafayette, Ind., succeeding Prof. W. F. M. Goss, who recently went to the University of Illinois.

N. Lilienberg, metallurgical engineer, Philadelphia, has returned from an extended trip to Europe. A large portion of his time abroad was given to visits to iron and steel works in Sweden.

M. S. Dennis has been appointed purchasing agent of the American Sheet & Tin Plate Company, at Pittsburgh, to succeed R. A. McKinney, resigned.

## Labor Notes.

Ohio has a law providing that not more than 10 per cent. as many convicts may be employed in any kind of contract labor as are employed, free, in the same kind of work, except in cases where the total number of men concerned is 50 or less. The Baldwin Forging Company, Columbus, Ohio, manufacturer of shovels, employed 175 convicts while there were only 219 free laborers making shovels in the State. An attempt was made to cut down the force of the company to the legal 22, but Judge Bigger of the Court of Common Pleas has declared the law unconstitutional, because it discriminates in favor of small concerns.

Complications have arisen between union machinists and the Great Northern Railroad, which may cause a strike. The machinists ask an advance of from 10 to 15 per cent. in wages and union shop conditions. Nearly 3000 machinists are employed.

The Iron Molders' Union has declared off the strike that has been on at the plant of the Bass Foundry & Machine Company, Fort Wayne, Ind., since the latter part of April. About 130 molders and coremakers were affected. After the strike had been in progress for a few weeks 25 to 30 molders withdrew from the union and applied for their old positions. The company does not expect to give places to all the men who went out, as many independent workers have been employed in the past few months.

The Thomas Carlin Sons Company, Allegheny, Pa., has secured a permanent injunction against Arthur E. Ireland and the International Association of Machinists and its officers to prevent these parties from interfering with the company in the operation of its works.

**Floating Machine Shops.**—An old cruiser was converted into a floating workshop some years ago by the United States Navy, and was equipped to perform the necessary repairs for a fleet at sea, which were too much

for the workshops carried by the larger vessels, but not enough to require immediate return to a port where repairs could be made. The practical value of such a vessel has been amply demonstrated, the *Vulcan* being of great use to the navy during the Spanish War. In England this idea has been carried a step further, a new vessel having been built which is to be practically a naval machine shop. There will be a fully equipped foundry with cupolas, where damaged parts of machinery may be replaced by new castings; a boiler shop, with shearing and punching machines; a carpenter shop, forge shop and a regular machine shop. There will also be a special department where electrical repairs and renewals can be made. The vessel will be provided with a large ice making plant, and a set of gigantic condensers or evaporators, capable, if necessary, of supplying fresh water to an entire fleet.

## The American Demand for British Iron Little Missed.

The practical pinching out of the American demand for Cleveland pig iron has made very little difference apparently in the British iron market. Reports at the close of July indicated that increased orders from Germany and Italy had prevented the slackening naturally expected when American buying ceased. Shipments by water out of the Cleveland District in July amounted to 156,025 tons. Germany was the largest customer, while Italy took 10,694 tons and the United States but 5798 tons. Warrant stocks at the end of July were only 226,000 tons, a reduction of 400,000 tons since July, 1906, and of nearly 250,000 tons in the four months ending with July. Producers in the Cleveland District have never carried as little stock as at present, and all requirements for prompt iron are met from warrant stores. The demand for Cleveland iron is still in excess of the production and a good autumn trade is promised. In the last week of July No. 3 Cleveland G. M. B. pig iron sold at 58 shillings 3 pence.

**German Pig Iron Production.**—Statistics have been gathered of the production of pig iron in Germany in the first six months of 1907. The distribution among the various grades of iron is as below, with corresponding figures for the first half of 1906, all in metric tons:

	Six months' output.	
	1907.	1906.
	Tons.	Tons.
Foundry	1,095,225	1,050,878
Bessemer	235,788	238,492
Basic	4,128,573	3,953,539
Ferro and spiegel	501,687	451,407
Forge	394,680	419,810
Totals	6,355,953	6,117,126

The increase over the first half of 1906 is 238,827 tons, and 1,257,365 tons over the first half of 1905.

**Motor Car Wheel Problems.**—A rubber tire becomes very hot when at work, says the *Automobile*. The kneading to which it is subjected produces internal friction within the body of the material, and the tire will frequently heat up to the point of bubbling or smoking. On paper it is a very easy matter to design a steel wheel with internal springs that will work with perfect satisfaction. This problem of spring wheels is one which has for many years engaged the attention of manufacturers of traction engines. Many spring wheels have been tried, hundreds have been invented, but all, or nearly all, have been relegated to the scrap heap. A steel spring has only a very limited life. It will bear, before breaking, only a certain limited number of flexions. Some wheels, apparently of sound design, fail from the presence of dirt or grit. A spring composed of a block of india rubber inclosed in a metal supporting cylinder might be expected to endure; but india rubber has definite limits even when afforded such excellent support. It has been suggested that the best solution of the whole problem is perfect road surfaces, on which steel wheels would run without shock.

## The Machinery Trade.

NEW YORK, August 14, 1907.

A decidedly optimistic feeling prevails in the machinery trade over the outlook for the future, and it is the general belief that the stock market flurries will have little effect on business in the immediate future. Last week was a good one for general business, and at least one Liberty street machinery house did more than was done in any week of the previous month. The orders placed were mostly from small manufacturers, the more important interests doing little or no buying. While there are no large lists before the trade, the indications are that the next month will see a number of good inquiries, especially from railroad sources. The Boston & Albany Railroad is now preparing a rather large list for its new Springfield shops, and the Norfolk & Western has been doing some scattered buying and has a few inquiries out. It is said that the Southern Pacific will shortly come into the market with a list of machine tools, and before long the Delaware, Lackawanna & Western will have a list out for the new Scranton shops.

An increase is observed in the inquiries from export houses, especially those having South American connections, and this is attributed to the fact that European manufacturers are offering terms as to prices and delivery noticeably in excess of what they were a few months ago. Export men in this city have been able to supply machinery equipment, especially in the power line, to the South American trade at advantageous terms of late, and consequently they have built up their trade considerably. The number of inquiries in the power line is particularly large just now, and the buyers are able to offer terms as regards payment that will appeal to manufacturers in this country. Consequently a good deal of business that formerly went to German and English manufacturers is coming here. It is also noted that there are a good number of inquiries for general machinery, indicating that manufacturing in various lines in South America is noticeably growing.

There seems to be an unusual demand for mining machinery just now, especially in Montana, and a number of New York machinery houses specializing in that line have been doing a large amount of business of late. The power men are also getting considerable business from Western mining companies, and during the last month one engine company sold to mining men more machinery than was ever sold before to mining enterprises in any two months' business.

The American Cyanamid Company, which was recently incorporated, with offices at 100 Broadway, New York, and the Cole Building, Nashville, Tenn., will in all probability come into the market shortly for a large amount of machinery for manufacturing calcium cyanamid for fertilizing purposes. The company has a capital stock of \$5,000,000, and it proposes to build plants at Niagara Falls, and on the Tennessee River, near Florence, Ala. The Niagara Falls plant will have a capacity of about 5000 tons, and the one in Tennessee will be of about 20,000 tons capacity. Arrangements have already been made for obtaining the electric power for the Tennessee plant from the Muscle Shoals Hydro-Electric Power Company. It is the company's intention to build other large plants in the South and West. Frank S. Washburn of Nashville, Tenn., is president; Charles S. Baker of New York, vice-president; A. H. Robinson of Nashville, Tenn., treasurer. These three and Thomas F. Oakes and Henry Parsons of New York, Abram C. Read of Nashville and J. W. Worthington of Sheffield, Ala., are the directors.

### Spanish American Iron Company Buying.

The specifications now in the trade indicate that the Spanish-American Iron Company, 71 Broadway, New York, will buy a large amount of machinery equipment for its iron mining enterprise at Mayari Incline, Cuba, which is described at length elsewhere in this issue. The company expects to spend about \$5,000,000 in developing its property, and the work now under way includes the construction of several miles of railroad, for which considerable power and railroad equipment will be needed. The company expects to build a small system of repair shops, which will include a machine shop, blacksmith shop and foundry. The buying for this work is now being done, and some orders for machine tools were placed during the week. The company will also need a large amount of outdoor equipment and considerable in the way of mining machinery. The buying is being done from the company's office in New York.

The Hammack Steel Range Company, 617 Prince street, Knoxville, Tenn., which was recently organized, is in the market for a good sized list of equipment to be installed in a building containing about 25,000 sq. ft. to be used for the manufacture of the Hammack Star range. The company would like to get prices on boilers and engines, foundry supplies, including cupola, mills for cleaning castings, circular

shears, punches, emery machinery, power and hand drills, brakes, complete nickel plating, wood working machinery for pattern shop, &c. The company expects to spend about \$25,000 for its building and equipment, and M. V. Hammack, president and manager of the company, will have charge of the details. Frank J. Jones, secretary and treasurer of the company, is the engineer, and M. E. Parmelee, 123½ Clinch avenue, Knoxville, Tenn., is the architect.

The McArthur Electric Mfg. Company will shortly buy equipment for a lamp making factory at Vineland, N. J. The company has just completed a plant with an output of 5000 lamps a day, but it is not adequate for the demands made for the company's product and an additional plant will be erected which will be about four times the size of the present factory. The company expects to spend about \$30,000 for machinery with which to manufacture incandescent lamps and arc lights. The firm was recently incorporated under the laws of New Jersey, with a paid up capital of \$300,000. The company's executive offices are at 310 Broadway, New York.

The Mergenthaler Linotype Company, 150 Nassau street, New York, will use the two upper stories of the addition to its plant on Ryerson street, Brooklyn, which was mentioned in these columns recently, for office and drafting room purposes. The building will be 165 x 174 ft. in size and eight stories in height. It is understood that the lower floors will be used for manufacturing purposes, and machine tools, such as drill presses, milling machines, planers, &c., will be installed for the manufacture of the Mergenthaler linotypes. The company is planning later on to build a foundry, and during the next few months the trade can look for considerable business from that source.

The Ensign-Bickford Company, Simsbury, Hartford County, Conn., manufacturer of safety fuses, is building a machine shop at a cost of \$5000. The building will be a one-story brownstone structure, and the basement will be used for storage purposes.

The Heller Brothers Company, Newark, N. J., manufacturer of rasps, files, farriers' tools, &c., is erecting a new rolling mill at its steel plant to contain a full train of 10-in. rolls and a train of 18-in. rolls. The company will also install the usual engines, furnaces, straightening plates, shears and planishing rolls. An iron building, 60 x 200 ft., is being erected to contain the equipment, and it is expected to have it running by the first of the year.

### Catalogues Wanted.

The technology department of the Carnegie Library, Pittsburgh, Pa., is making an extensive collection of trade catalogues, and will be glad to receive and file the printed matter of manufacturers. The catalogues will be carefully listed under both firm name and subject, and will be accessible to the public. They should be addressed to H. W. Craven, Technology Department, Carnegie Library, Pittsburgh, Pa.

### Business Changes.

The Philadelphia office of the Vandyck-Churchill Company has been moved from the Bourse to 917 Arch street.

## Chicago Machinery Market.

CHICAGO, ILL., August 13, 1907.

The machinery market continues to share in the quieter movement now generally prevalent in most branches of the iron and steel working industries. An unqualified condition of positive dullness can hardly be said to exist, though in comparison with the remarkable activity of preceding months it has that appearance. In reckoning up the weekly totals dealers find that, considering the sluggish effects of the vacation period, enough business has been booked to keep available forces busy. The character of orders now coming in reflects a halting tendency in the promotion of large enterprises. Little is heard in the market of inquiries embracing lists of machine tools for new equipment on a large scale, and no orders of consequence are being placed on any of the notable lists heretofore mentioned. Such support as the market now has comes mainly from the smaller shops, which are adding to their equipment as occasion requires. This demand is augmented by a considerable number of new machine shops and factory plants being started in a small way, especially in the West. These enterprises are usually not dependent upon the help of outside capital, being financed locally, and are therefore not subject to the restraint that holds back many larger operations. While, as a whole, machine tool makers are slowly whittling down their lists of overdue and long extended deliveries, it is nevertheless true that several of the standard makes of lathes, planers, millers and automatic machines are not obtainable on order for many months to come. Orders for millers, large planers and

other tools have recently been placed for delivery from 12 to 15 months hence. If the present lull in trade lasts long enough to effect a reasonable clearing up of unexecuted orders, and enables makers to strike a balance and see where they stand, the result cannot be other than wholesome. The demand for electrical equipment has also fallen off to some extent all along the line. That part of the decrease is due to seasonable dullness is evident, though other influences have had an important bearing upon the situation. The excessively high cost of production, due in a large measure to the inflated values of copper and pig iron, imposed a burden that was beginning to hinder progress. Builders of electrical machinery and appliances, therefore, view the decline in metals and crude iron with satisfaction, believing that trade will be largely benefited by a restoration of something like normal price levels.

A new steam engine of the rotary or turbine type designed and invented by Warren F. Bleeker, Boulder, Colo., has been the subject of a good deal of interest in the State University at that place, where it has been under test. The engine, which is styled the Universal steam motor, will be built by a company of which W. F. Bleeker is president, and plans are being made for the establishment of a plant for its manufacture. It is stated that the company will very shortly be in the market for about \$15,000 worth of new machines, including lathes, millers, planers and other like machinery required to suitably equip a first-class machine shop. The company is anxious to receive catalogues and information relative to such machinery, which may be addressed to W. F. Bleeker, 2331 Twelfth street, Boulder, Colo.

The municipal electric light plant of Lowell, Ind., has been purchased by Clifford Wiley, 138 Washington street, Chicago. The new owner has organized the Lowell Light & Power Company, which will build and occupy an entire new plant. Plans for the building are now in course of preparation, and actual work of construction will be begun within a short time. The steam generative equipment will consist of two 150-hp. boilers, with suitable heaters and connections. A 125-hp. engine, probably of Corliss type, will be required to furnish motive power for a 120-kw. a. c. generator.

For the partial equipment of its new shop at Mobridge, S. D., and the shops at Montevideo, Minn., the Chicago, Milwaukee & St. Paul Railroad is in the market for the following tools: Two 36-in. lathes, one 16-in. bolt lathe, one steel pressure blower, two 34-in. back geared drills, one 1½-in. bolt cutter, two 36-in. planers.

The City Council of Rockford, Ill., has approved plans for the improvement of the power plant of its water works system, which will require the purchase of one 150-hp. return tubular boiler and the erection of a 200-ft. smoke stack, with an inside diameter of 6 ft. The superintendent, David R. Crowley, has been authorized to negotiate for the purchase of the equipment.

The Allen's B. B. B. Flour Company, Inc., San José, Cal., with a view to extending its business in its Eastern territory, has approved plans for the erection of a three-story brick building, 40 x 80 ft., at Des Moines, Iowa, with an engine and boiler house, 30 x 40 ft., for which motor power equipment will be required.

The Industrial Works, Bay City, Mich., manufacturer of wrecking, locomotive and station cranes, and other railroad construction and shop equipment, is now engaged upon preliminary plans for the erection of a new gray iron and steel foundry. This building will be 160 x 300 ft., and will add materially to the output capacity of the plant, which is now taxed as a result of a largely increased business. Among recent contracts executed by the company are a 20-ton locomotive crane for the Watertown Arsenal, Watertown, Mass., pontoon crane for the United States Navy Yard, Pensacola, and two pile drivers for the Isthmian Canal Commission. Besides these there are now under construction in the works a locomotive crane of 10 tons capacity for the League Island Navy Yard and four 20-ton cranes for the Isthmian Canal Commission.

The O. K. Harry Steel Company, Inc., St. Louis, Mo., has been organized with a capital stock of \$40,000, and will take over the plant and business of the O. K. Harry Steel Works, manufacturer of steel tanks, culverts and roofing. F. L. Nelson is president of the new company; Wyan Nelson, vice-president, and Chas. M. Hummel, secretary and treasurer. Plans for the future development of the business are not wholly completed, and as yet are under advisement. While improvements involving the installation of additional machinery are contemplated the company is not in position at this time to state its requirements.

The General Compressed Air & Vacuum Machinery Company, 4436-4438 Olive street, St. Louis, Mo., has increased its capital stock from \$120,000 to \$750,000. The entire amount of the increase, it is stated, has been fully paid in in cash, \$200,000 of which will be used for the erection of a new plant on a site selected in the southern part of the

city. The remainder will be devoted to the expansion of the business. Work on the new building will be begun at once, but plans for its machinery equipment have not been developed, and consideration of anything relating to this portion of the work will not be taken up at present.

The Irving M. Phillips Company, sales agent for steel factory equipment and punching and shearing machinery, representing the Terrells Equipment Company, Grand Rapids, Mich.; New Doty Mfg. Company, Janesville, Wis.; B. M. Root Company, York, Pa., has removed from the Western Union Building to 43 South Clinton street, Chicago.

The Wilmarth & Morman Company, Grand Rapids, Mich., makers of the New Yankee drill grinder, arbor presses and friction countershafts, states that the shipments of its regular product for the first seven months of this year to August 1 were 26 per cent. greater than for the corresponding period a year ago. For the month of July shipments show an increase of 21 per cent. over the same month of the previous year.

Owing to the pressure of demand for their milling machines, Kearney & Trecker, Milwaukee, Wis., have been compelled to add an extension, 20 x 136 ft., to their factory building. The construction of this addition is being rushed to get immediate relief from the present overcrowded shop capacity.

The Joplin & Pittsburgh Railway Company, Kansas City, Mo., has been recently organized with a capital of \$5,000,000, and has taken over the Pittsburgh Railway & Light Company's properties, Pittsburgh, Kan., and the Joplin & Pittsburgh Street Railroad Company, the latter having under construction an urban line in the city of Joplin. It is the purpose of the company to connect the lines acquired at Pittsburgh, with those at Joplin, to effect which a line 26 miles in length will be built. Bonds for \$2,800,000 are being issued, \$2,200,000 of which will be held in the treasury for future extensions and betterments. When plans now under way are completed and carried out the company will have 85 miles of urban and interurban trackage.

## Philadelphia Machinery Market.

PHILADELPHIA, PA., August 13, 1907.

Transactions in the local machinery market have continued on a fairly even basis. The total sales of the week were not very large, but the amount of business done was considered fair for the season. Financial conditions have not been favorable for the active buying of machine tools recently, and it is likely that no large transactions will be made until these conditions adjust themselves. A little more inquiry has developed for radial and multiple drills, and orders for several good sized tools were booked. Light lathes have also been in good demand, but practically all of the business closed during the week was confined to the lighter tools and mainly for single tools.

There is practically no inquiry of any magnitude before the trade in this territory which is likely to develop in actual business in the immediate future.

Quite a few specifications are before the trade from the Pennsylvania Railroad Company. A number of these, however, are from one to two months old and are mostly for single tools. Just when these will develop in actual orders is difficult to foretell. There seems to be a disposition on the part of the prospective buyer, particularly where tools are required for re-equipment, to hold off awhile, to see what will develop, and in the meantime the old tool is kept at work even though it has already been condemned to the scrap pile.

Deliveries under existing conditions are improving in some lines, and builders of some classes of tools can make fairly prompt shipment, while in many instances immediate shipment from dealers' stocks can be had. Manufacturers as a rule keep busy. Most of the plants are booked well ahead.

Taking it all in all, the general impression in the trade is that buying will be rather quiet during the next 30 days, after which time it is expected that many of the various plans which have been held in abeyance during the summer months will come up for consideration, and as these are acted upon buying will develop more actively.

There is practically no change in the foreign demand. Some little business has been done, but, on the whole, sales of tools of the standard types have been rather light. Special tools are in more active demand, and some fair business has been placed in those lines.

The second-hand machinery market has been rather inactive. Sales have been closely confined to the smaller machine tools. Boilers and engines have been in slightly better demand, although sales made have been mainly of the medium and smaller sizes.

The iron and steel casting plants continue actively engaged. Production, during the heated term, is generally reduced, and some foundries are still unable to make the

deliveries desired by their customers. In other cases, however, there is a lessening demand, and some plants are seeking business for near future delivery.

The Pennsylvania Railroad Company's plans to abolish grade crossings on its Kensington Branch are rapidly assuming definite shape. A steel viaduct will be built from Cambria street to practically the present depot at Front and Norris streets, crossing Tioga, Ontario, Westmoreland, Willard, Clearfield, and Ann streets, as well as Allegheny avenue. A contract for the grading and masonry work is understood to have been let for a small portion of the work. The cost is estimated at \$2,500,000, a portion of which will be paid by the city.

McCormick & Co., contractors, 14 South Broad street, have been awarded the contract to build a new bridge over Mulberry street, Harrisburg, Pa. This will be a 14-span reinforced concrete bridge, the contract price for which is \$260,000.

A syndicate headed by J. D. Lit, of this city, has, it is understood, purchased a large plot of ground at Fifth and Locust streets, on which it is proposed to erect a five or six-story manufacturing building. The lot has a depth of 198 ft. and a frontage of 116 ft., on Fifth street. Heywood Brothers & Co., chair manufacturers, are stated to have arranged for a long lease of the building when completed.

Two new electric passenger elevators are to be installed in the local United States Court House and Post Office Building, proposals for which will be received by the supervising architect, J. Knox Taylor, Washington, D. C., until September 3.

Plans for the new steel plant of the Tropenias Steel Company, to be built at New Castle, Del., are reported to be rapidly nearing completion, and it is probable that work on the erection of the building will be started within a few weeks.

Proposals will be received until August 22, by the Director of Public Works, Bureau of Filtration, for the sale of 111,192 lb. of seamless brass tubing, 2 in. in diameter, stored at the Belmont and Torrendale filter plants. Details regarding this material can be had upon application to the Bureau of Filtration, room 710, City Hall.

Thomas H. Dallett & Co., Inc., report an exceptionally good demand for pneumatic machinery for stone working and several extensive equipments in this line have been recently exported to Italy. Inquiries for their various types of portable and boiler shell drills have been good. All departments of the plant are fully engaged and sufficient business is in hand to keep them so occupied for some time, while the outlook for future business is considered very satisfactory.

The Espen-Lucas Machine Works has closed a number of good orders for its line of machine tools, including horizontal floor boring machines, milling machines, automatic saw sharpening machines, portable boring mills, crank shaft forming machines, and cold saw cutting-off machines for steel foundry, bar and structural work. The demand for cold sawing machines appears to be along the lines of the heavier tools, one for steel foundry purposes being for a machine weighing over 24,000 lb. complete. Several large tools have recently been furnished industrial plants and railroads. This company has sufficient work on hand to keep its plant actively engaged for some time.

### Cleveland Machinery Market.

CLEVELAND, OHIO, August 12, 1907.

The local machine tool market is a little better, and while no large orders are being placed, fair sales of a few tools to a purchaser have been made. There is an increase in the number of inquiries, some rather good sized ones having been received during the week. Some manufacturers have apparently been holding off in making purchases of machine tools needed in their plants, because of the poor deliveries and high prices. Now that the deliveries have become a little easier, and there being no indication that tools will become cheaper for some time, there is expected to be an improvement in the demand for tools to replace worn-out shop equipment. While there is a scarcity of new projects requiring extensive machine tool equipment there are quite a few small shops starting up, that require tools. Nearly all the purchasers want quick deliveries and the dealer who has the tools needed in stock has the advantage in making sales. While dealers are receiving tools to replenish stocks on old orders somewhat more promptly than they were a few months ago, these tools are being sold about as fast as received, so that store room stocks are not much better than they were. The supply of second-hand tools is more plentiful than it was, but these tools are being sold out about as fast as they are received.

Manufacturers of heavy tools and machinery used by

railroads report a good demand from railroads in the central and western States, but not many sales in the east. Machinery manufacturers having a foreign trade report a very good demand from South American countries, but not much of a demand from European countries at present.

Prices of all machine tools remain stiff and one manufacturer has announced an advance of from 10 to 15 per cent. in the prices of heavy planers during the past week.

The Osborn Engineering Company will place orders within the next three or four weeks for the machinery and power equipment for the new plant of the Chanute Cement & Clay Products Company, Chanute, Kansas. The plant will have a daily capacity of 3000 barrels of cement. About 3000 hp. will be required for the engine and boiler equipment.

The Pattison Supply Company, dealer in machine tools, has just placed in stock a complete line of milling cutters made by the Brown & Sharpe Mfg. Company. The company has been handling these goods, but up to now has never kept them in stock.

The Standard Truck Company, Cleveland, has been incorporated, with a capitalization of \$100,000. The incorporators are attorneys representing the men back of the company, whose identity has not yet been made known. The company intends to manufacture steel trucks for street cars, automobiles and other purposes.

The Morgan Engineering Company, Alliance, Ohio, is in the market with an inquiry for about 15 large machine tools, including engine lathes, milling machines, boring machines and drill presses.

The Atlas Anchor Company, Cleveland, has been incorporated, with a capitalization of \$20,000. The principal product will be anchors for telephone and trolley poles. The company's manufacturing will be done for the present at the plant of Frost Wire Fence Company, some of the promoters of the anchor company being interested in the fence company. The incorporators of the new company are C. E. Frost, R. W. Dearing, T. J. Frost, K. F. Leet and S. E. Maggi.

The Brown Hoisting Machine Company reports that its sales of locomotive cranes have been larger this year than ever before. This company is also having a very heavy demand for trolleys and for small hand traveling cranes for industrial plants. While the demand for the company's products from European countries is not as large as it was a good increase is noted in orders from South American countries.

The Cleveland Metal Mfg. Company has been incorporated, with a capitalization of \$10,000, by C. W. Noble and other attorneys representing the projectors of the company. The company is not yet prepared to announce its plans.

The Rickersberg Brass Company, Cleveland, has been incorporated, with a capitalization of \$50,000, by Emanuel, David L., Solomon and Sidney Rickersberg and Joseph J. Klein. The company will establish a brass foundry for the manufacture of plumbers' supplies.

The Canton Mfg. Company, sheet metal workers, Canton, Ohio, has increased its capital stock from \$25,000 to \$100,000 and has purchased additional land to be used as a site for a large addition to the plant which will be built soon. It is the intention to add from 20,000 to 30,000 ft. of floor space. The company began business in February, 1906, and has already outgrown the capacity of its plant. M. H. Gunther has retired from the superintendence of the company, being succeeded on August 1 by L. B. Sharpnack, formerly superintendent of the Eller Company of Canton.

The Kanneberg Roofing & Ceiling Company, Canton, Ohio, has purchased the property formerly occupied by the Canton Insulator & Clay Company. The property includes 4½ acres of land, together with a warehouse and factory buildings. It is understood that the Kanneberg Company intends to use the property for the enlargement of its plant.

Plans for a new foundry for the Bay View Foundry Company, Sandusky, Ohio, are being prepared by the Osborn Engineering Company. The building will be 80 x 100 ft.

The Buckeye Rubber Company, Akron, is preparing to build an addition to its plant for the manufacture of automobile tires. The building will be of brick, 40 x 250 ft. and two stories high.

The Royal Motor Car Company, Cleveland, has increased its capital stock from 50,000 to \$100,000. The Royal company is building a large new plant, which is now nearing completion.

The Bower Roller Bearing Company, Dayton, Ohio, which was recently incorporated, has leased a plant containing 16,000 sq. ft. of floor space in Dayton, and will begin the manufacture of roller bearings for vehicles and machinery as soon as its factory is equipped. The company is now in the market for screw machinery, steel tubing, forging equipment, factory supplies and motor drives for its machine tools. The details regarding the equipment will be looked after by R. F. Brown, president of the company. The other officers are: G. W. Mearich, vice-president; C. H. Heller, secretary; F. W. Dye, treasurer, and the above officers and F. W. Heller, N. W. Mearich, E. Corike, C. Shonts and F. Sellers are the directors.

## New England Machinery Market.

WORCESTER, MASS., August 13, 1907.

One occasionally meets a man whose opinion of the future of the market has been unsettled by the various influences that have beset industrial and political affairs during the past fortnight. These men are exceptions, however. The great majority of manufacturers and dealers see no reason to change their belief that if there is to be a recession in business it will not be a great one, and should have a healthy influence. Moreover, it would mean, according to general opinion, a more profitable condition in dollars and cents. The autumn is expected to tell the story of just what the conditions are. The midst of the dog days is not a fair period in which to size up a business outlook. Reports from dealers and manufacturers, based upon actual business transacted, are encouraging. The last week has been excellent with the dealers in a moderate way. Sales were mostly of small lots and single tools, with a few orders running well into thousands of dollars. A few excellent contracts are in sight. Several machine tool builders state that the fortnight past brought an increased volume of orders as compared with the month preceding, though these houses have found a falling off during the last two months and have made satisfactory gains on deliveries. A very large manufacturer of a product much used in metal working reports that July showed 35 per cent. greater business than the same month of 1906. No instances are cited of an important depression in a business to counteract the significance of hopeful signs in drawing deductions. The demand for copper products, and those of its alloys, such as brass, has decreased, but this is always the case when the price of copper drops, customers stopping buying in the hope of still lower figures and in waiting for the change in lists which should follow with the various products in which copper is a factor. As the consumption of copper and the products manufactured from it has not noticeably decreased an early resumption of orders may be anticipated.

The manufacturers report a marked falling off in stock orders from the dealers. Not all of the latter have materially curtailed their buying in anticipation of the wants of customers, but in the aggregate the manufacturers' order books show a material difference as compared to the earlier months of the year. This means that sooner or later the dealers will be placing most of their orders direct from customer to manufacturer, which is considered a very satisfactory way of doing business. It is a part of a profitable condition of trade, where there is an actual consuming demand, with works running full and deliveries reasonably prompt.

Collections are a little slow, as always at this time of year, where the absence of treasurer or bookkeeper may constitute reason for a delay that would not occur at other seasons.

The College City Cutlery Company is organizing at Northampton, Mass., to manufacture cutlery of the type known as common work, including woodworking tools, knives, forks, toothpicks, &c. A. J. Dunphy, P. O. Box 162, Northampton, the secretary of the company, is the prime mover in the enterprise. He states that he desires catalogues from manufacturers of trip hammers, drop hammers, rollers and fireboxes for the forge room, tools for the full equipment of a machine shop, machinery for the manufacture of wooden handles, metal room equipment, shafting, arbors for grindstones and polishing wheels and the wheels themselves. A building has been secured which will provide quarters for all departments excepting the forge room, and a new building will be erected for this department. The company will have an authorized capital stock of \$50,000.

Fred. P. Holt, Hartford, Conn., is to erect a factory building, 25 x 31 ft., four stories, for rental to manufacturers.

The Hartford & New York Transportation Company is building a new shipyard at Hartford, Conn., which will replace the plant at Dutch Point, that city. The yard will be used for refitting and building purposes. The machinery of the present yard will be moved to the new quarters, and the company states that it is not at present in the market for new machinery. The old property has been sold to the Hartford Electric Light Company.

The Blakeslee Forging Company, Plantsville, Conn., is to build a wooden addition to its forging shop, 40 x 60 ft., and is installing a gas producing plant and engine. The company reports the past year as the most prosperous in its history.

The fire at the works of Wilcox, Crittenden & Co., Inc., Middletown, Conn., manufacturer of marine hardware, July 31, did not cause the serious loss attributed to it in the re-

ports published in the daily press. The buildings burned were the office building and an ell adjoining, which were completely gutted, but the contents of the safes were intact. The galvanizing department and forging department were destroyed, but arrangements have already been made for doing the company's galvanizing, and a forge shop in the neighborhood has been rented. None of the foundry buildings was in any way injured, and the machine shop and shipping departments were not touched by the flames. Consequently the company is in no way seriously crippled and is already filling orders and awaits the demands of its customers.

The Whitney Mfg. Company, Hartford, Conn., is to add another building to its new plant recently completed in that city. The building will be one story, 40 x 50 ft., and will be devoted to hardening, tempering, annealing, &c.

The Norwich Nickel & Brass Company, Norwich, Conn., manufacturer of display frames, stands, &c., is contemplating the erection of a new factory, but plans are not completed and no final decision has been reached. The tentative plan calls for a concrete structure, 50 x 200 ft., three stories.

The news comes from Hopedale, Mass., that C. F. Roper & Co. of that town are to enlarge their works by the erection of new buildings, and will extend their business generally. Gen. William F. Draper, until recently president of the Draper Machine Works, Hopedale, has become actively interested in Roper & Co. and will look after the financial end, while Charles F. Roper will manage the shop end. C. F. Draper will also be an active member of the firm. It is proposed to develop and manufacture a speed controlling reversing propeller, the invention of Mr. Roper. A main building will be 48 x 60 ft., two stories and basement, while a brass foundry and stockroom will be 30 x 48 ft., one story.

L. M. Barnes, 127 Main street, New Britain, Conn., is to establish a factory and garage in that city and will erect a brick and steel building, 40 x 80 ft., three stories and basement. He requests catalogues of gas engines, gasoline storage tanks and air pressure storage tanks.

The American Typewriter Company is to remove its plant from Derby, Conn., across the Naugatuck River to Shelton, where it has leased a factory. The Williams Typewriter Company, Derby, has been manufacturing parts for the American Company, which will hereafter do its own work. The company is about to put a new typewriter on the market. No new machinery will be required at present.

The Holmes Machine Company, East Boston, manufacturer of leather working machinery, has been petitioned into bankruptcy.

The Manville Bros. Company, Waterbury, Conn., manufacturer of metal working machinery, has purchased land upon which it plans to erect new works.

## Government Purchases.

WASHINGTON, D. C., August 13, 1907.

The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until September 3 for annealing furnace, locomotive boiler and a quantity of other supplies for the Mare Island Navy Yard.

The Isthmian Canal Commission will receive bids until August 22, circular No. 382, for direct connected engine and dynamo shop machines and other supplies.

The following bids were opened August 6 for supplies for the navy yards:

Class 51. One milling attachment for planer—Bidder 119, \$298.

Class 52. One Jones & Lamson turret lathe—Bidder 79, \$1910; 121, \$3650.

Class 53. Two wet emery grinders complete—Bidder 55, \$618 and \$812; 107, \$635; 119, \$618; 181, \$120.

Class 61. One motor driven planing machine—Bidder 100, \$5287 and \$5212; 119, \$5694; 145, \$5550.

Under circular No. 369, opening of June 28 for two suction dredges for the Isthmian Canal Commission, the Maryland Steel Company, Sparrows Point, Md., has been awarded contract for one suction dredge at \$8675.

Under opening of July 16 for supplies for the navy yards, Lewis & Kitchen, Chicago, Ill., have been awarded: Class 1, one garbage incinerating plant. The firm's bids were: Item 1, \$8975; item 2, \$5305; item 3, \$2670; item 4, \$1950; item 5, \$1.10; item 6, \$160, and item 7, \$2.20.

John B. Roche, Brooklyn, N. Y., has been awarded class 83, five hydraulic jacks and six screw jacks, \$257.08, under opening of July 30 for supplies for the navy yards.

Under opening of July 23 for supplies for the navy yards, the Toledo Machine & Tool Company, Toledo, Ohio, has been awarded class 11, one large geared trimming press, \$3098.

## Ore Shipments Becoming Normal.

DULUTH, MINN., August 10, 1907.—Mesaba miners have quite generally gone back to work, and the strike is a memory except in the minds of a few leaders who endeavor, by their talk, to convey the impression that it is still curtailing production materially. On one day when they talked loudest receipts at the docks of the Duluth, Missabe & Northern Railroad were 80,000 tons, an average for the season, and the full schedule of trains was in operation. The speed with which full operations have been resumed is astonishing. In the case of the Duluth, Missabe & Northern, there were three days shipments in dock, and when these had been taken by ships arrivals at dock were well up to the average and have been about 80,000 tons a day for the week. It did not seem possible to get into full swing so rapidly. Other roads are in the same situation. Vessels are quite badly bunched and will be so for some time, which may militate against the best execution of business, but this is straightening itself out also. On the docks there is no difficulty anywhere.

### New Piers and Docks.

The firm of Barnett & Record has secured the contract for the Duluth & Iron Range Railroad's steel ore shipping pier, including everything, at about \$1,200,000. It is hoped to have the pier in readiness by May or June next. This will be No. 6 dock and will occupy the remaining space in Two Harbors harbor, west of and close to No. 5 pier. There is scarcely room left for this dock, and the big ships now trading on the upper lakes will, especially in times of wind, have a difficult job in making the turns required to approach No. 6. The railroad company has planned to utilize an adjacent bay, Burlington, for any additional piers, and will be forced to do so when any more docks are constructed. But it evidently did not wish to ask the general government to improve this bay for docks and navigation purposes, and did not care to undertake the expense of constructing breakwaters there.

The Duluth, Missabe & Northern Railroad has torn down its first shipping pier, built in 1894, and is erecting in its place one of the largest coal receiving docks at the head of the lakes. This new dock will be chiefly of concrete and steel, and will be ready for the coming year. There is a tremendous impetus in the construction of coke receiving docks here, half a dozen independent mining and forwarding coal companies having begun or completed immense modern docks during the past year and a half, and shipments from the head of the lakes to the interior now average better than 500,000 tons per month. Heavy up-lake business in coal is sure to have its effect on the ore rate and on ore dispatch, but all coal shippers have fortified themselves as far as possible by securing large amounts of tonnage during the recent dock men's strike at ore piers.

### Additional Ore Resources.

The Breitung interests of Marquette are to open the old Humboldt mine, near Negaunee, and railroad connection will be made immediately. The mine has been idle since 1891, though a few thousand tons of stocked ore were shipped afterward. It had been a shipper at intervals since 1864 and had made a total product of 725,000 tons. The ore was a hard non-Bessemer magnetite, and of good grade, indeed better than much being shipped from that range. When operations were stopped a good sized stope of ore was left. The deposit is about 20 ft. wide and was mined during the later years from No. 2 shaft, which was 300 ft. deep. There were in addition many open pits. The property will be equipped with an entirely new outfit of machinery, including a 150-h.p. boiler plant, 12-drill compressor and good hoisting works. The deepest shaft is 685 ft. deep, and will doubtless be retimbered throughout. As soon as the mine is unwatered, which will be by air compressor, development will be undertaken, if underground examination proves the promising condition that is looked for by the new operators. There is a small stock of second-class ore on the surface which will be moved to the market this fall. The same parties control the Washington mine, adjoining, and will doubtless reopen that also if the Humboldt proves up well.

G. H. Crosby and others, who have been exploring in sections 14 and 11, T 57 21, Mesaba range, have disposed of their finds to the Moore Iron Company, formed for that purpose by A. M. Miller of Duluth, and some Eastern furnace interests. Their ore body, amounting to about 7,500,000 tons, of what would now be considered merchantable, was sold for a cash bonus of \$60,000 and a royalty of 60 cents a ton. The same parties are now exploring an adjoining tract, and expect to find more ore of the same character. Mr. Crosby has become heavily interested in iron ore deposits in Iron County, Utah, and now holds about 10,000 acres not far from Cedar City, making him one of the larger holders of that region. No steps seem to be undertaken looking to the development of this field, and it may be some time before the Colorado Fuel & Iron Company, which is the largest holder there, is ready to open any of its properties.

Considerable development work is under way by the Brule Mining Company near Stambaugh station, Menominee range. Shaft No. 1 is already loading ore from underground and shipments have begun, to be continued throughout the season. No. 2 shaft will be shipping in a week or two. The mine will produce a considerable tonnage this year.

### New Records in Ore Hoisting and Shoveling.

One day this week at the Tobin mine, Crystal Falls, the single hoisting plant at the main shaft handled to surface from the 700-ft. level 560 skiploads of ore, in the 10-hour shift, each skipload being three tons. The actual time consumed in the work was, of course, somewhat less than the full period of the shift, so that the loads went up at the rate of one per minute for the entire day. While this record is by no means unknown on Lake Superior it is good enough to mention as quite exceptional.

At Ishpeming a steam shovel loader at the Lake mine of the Oliver Iron Mining Company loaded 3200 tons of ore into railroad cars in nine hours. The cars averaged 25 tons each, which militated against a rapid record, and makes the day's work excellent. The ore movement from Ishpeming has been very heavy. Every steam shovel on the range was pressed into service and at that town alone 29 switching crews were at work handling ore trains during the continuance of the Mesaba strike.

Some records in steam shovel loading from the mine beds, on the Mesaba, will no doubt be made this week.

There has been a marked falling off in the demand for non-Bessemer ores, and a good many shippers are revising their earlier estimates of probable production of that class of ore. Everything in Bessemer is snapped up, as usual, and there is hardly enough to go around, which accounts for the desire on the part of several owners of small Bessemer deposits to get them in shape for shipments as soon as possible. Several of the larger independent producers of non-Bessemers for their own works and for sale are restricting operations slightly, and will do so still more unless there is a revival of the demand for such ores.

D. E. W.

**Making Impure Water Available for Boilers.**—The constantly increasing cost of city water supplies becomes a burdensome expense to manufacturers dependent upon them, but since the art of softening and purifying water to fit it for all uses has been so highly developed supplies near at hand, which otherwise could not be used, have been made available, as shown in the following example: The Chartiers Creek at Carnegie, Pa., is contaminated with drainage from coal mines containing sulphuric acid and carries in solution a considerable quantity of scale forming matter, so that it is utterly unfit for boiler feed. The Superior Steel Company, Carnegie, Pa., in 1904 installed a 3000 hp. We-Fu-Go water softening and purifying system, in which to treat this creek water, which they obtained for the cost of pumping it, thus saving the cost of city water in addition to obtaining a better water. To meet an increase in the boiler plant necessitated by the large increase in the business, a second order, increasing the capacity of the system from 3000 to 7750 hp., has been placed with the Wm. B. Scaife & Sons Company, Pittsburgh, Pa.

## A Swiss Electric Locomotive.

A new locomotive weighing in all 43 tons, including driving equipment which alone weighs 23.5 tons, and equipped with single-phase commutator motors and carried on two four-wheeled trucks, has been built at Zurich by the Oerlikon Company. One motor is mounted on each truck, and geared in a ratio of 1 to 3.1 to an intermediate shaft, which, in turn, is coupled by means of a side bar to both axles. All four axles of the locomotive are thus positively driven. The bearing of the crank pin of the intermediate shaft is allowed a slight vertical motion, for the sake of flexibility. Each motor weighs 3.4 tons, and is rated at 200 hp. when making 650 turns per minute. Tests have demonstrated that the locomotive can start a 250-ton train up a 12 per cent. grade, and that it can attain a speed of 45 km. (28 miles) per hour without any sparking at the brushes.

The current collecting apparatus consists of a curved tubular rod of steel, on which brass rubbing pieces are mounted. These rods are mounted upon a swinging frame, there being two collectors for each locomotive. The arrangement enables them to be placed in contact with the trolley wire when it is on either side of the track, or at a point above the locomotive. The current is delivered at the low frequency of 15 cycles per second, though it is said that the motors operate equally well at 25 cycles. The normal speed of the motor is about three times that of synchronism. There are in each unit eight main poles, provided with compensating windings in grooves, which may be either short circuited on themselves, or placed in series with the main circuit.

## Lubrication Tests.

Some interesting and valuable experiments on friction and lubrication have been conducted for a research committee of the British Institution of Mechanical Engineers. The work was carried out with a steel shaft driven by a belt, and provided with a journal 4 in. in diameter and 6 in. long. Upon the upper side of the journal was fitted a gun metal step, the arc of contact being appreciably less than one-half the circumference. Various means of lubrication were tested, that one found the best being a bath of oil.

The experiments showed the friction to be nearly constant at all loads, within ordinary limits; which is at variance with the commonly accepted idea that it increases in direct proportion to the load. The coefficient of friction, with bath lubrication, varies inversely as the pressure. In other words, the friction of the bearing is entirely independent of the pressure upon it, provided this pressure does not exceed 400 to 600 lbs. per square inch. The coefficient, again, is inversely proportional to the temperature. The friction increases with the velocity of rubbing, at a rate expressed by about the 1.5 power. The coefficient varies with the lubrication used, and was found to be least for olive oil and lard oil. Sperm oil comes next, followed by mineral oil and mineral grease.

Hardening an ordinary drill in sulphuric acid makes an edge that will cut tempered steel or facilitate cutting hard rock, says *Compressed Air*. The acid should be poured into a flat-bottomed vessel to a depth of about  $\frac{1}{2}$  in. The point of the drill is heated to a dull cherry red, and dipped into the acid to that depth. This makes the point extremely hard, while the rest remains soft, and hence tough. If the point breaks, it may be rehardened with a little less acid in the vessel.

The average fire loss in the United States is said to be more than \$2 per head of the population, as compared with only one-third of a dollar in six of the leading European countries. The difference cannot be placed against the greater average wealth of this country, for no such ratio exists as is shown above. It must be ascribed largely to less rigidly enforced building laws.

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# HARDWARE

THE Government report on our foreign trade for the fiscal year ending June 30, 1907, affords an opportunity for noting the part taken in it by the industries closely related to the Hardware trade. The report shows that of the total exports in the fiscal year the value of exports of manufactures ready for consumption was \$479,700,679, being 25.87 per cent. of the aggregate exports. This amount is much in excess of the figures of any previous year. The fiscal year 1905 was the first in which the value of such exports exceeded \$400,000,000. The following table presents a comparison of Hardware exports in the fiscal years 1906 and 1907:

	1906.	1907.
Builders' Hardware, comprising Locks, Hinges, &c.	\$6,186,225	\$6,421,471
Saws	671,312	817,681
Tools, not otherwise specified	6,008,469	7,775,551
Table Cutlery	63,683	74,999
All other Cutlery	503,180	574,743
Firearms	2,030,535	2,769,917
Cut Nails	314,485	371,675
Wire Nails	2,095,488	2,098,923
All other Nails, including Tacks	426,445	611,991
Scales and Balances	845,870	976,383
Stoves and Ranges	1,188,967	1,342,617
Tinware	1,069,146	1,181,534
Wheelbarrows, Push Carts, &c.	468,728	497,986
Bicycles	1,370,765	1,182,914
Stove Polish	79,606	50,744
Twine	5,505,068	5,584,772
Cordage	886,561	934,630

It will be observed that almost every item given above shows an increase in the past year. The exceptions are Bicycles and Stove Polish. The falling off in Bicycles is not remarkable, as domestic business in this line had for several years shown a declining tendency. It is possible, however, that we may see an improvement in this respect, as the current season has brought a somewhat larger home business to our Bicycle manufacturers. The line making the heaviest gain in exports is Tools, which had an increased movement of over \$1,100,000. Firearms made the next heaviest gain. The increase in the exports of Builders' Hardware is noteworthy, as indicating the strong grip which our manufacturers have secured in foreign markets. The heavy exports of Twine and Cordage are exceedingly satisfactory in view of the admission into this country of Binder Twine free of duty. It is interesting in this connection to present some of the leading features of our import trade in Hardware lines. The following table presents a comparison of the imports in the same fiscal years of such articles as are separately classified:

	1906.	1907.
Binder Twine	\$342,829	\$227,490
Cordage and other Twine	370,534	407,997
Wire and Wire articles	823,931	1,330,852
Cutlery	1,802,278	2,263,107
Firearms	505,546	306,085
Enamelled Ware	*	878,248

\* Included in "all other manufactures."

The gain in the imports of Wire and Wire articles and in Cutlery is decidedly noteworthy. It is difficult to understand why such an increase should have been made in purchases of foreign Wire. The gain in Cutlery, however, is probably due to the fact that conditions in this country have been so prosperous that heavier purchases have been made of high grade foreign articles than in preceding years. It would be of much interest if a comparison could be had with previous importations of Enamelled Ware, but it appears that the fiscal year 1907 is the first in which a separate classification has been made of the imports of such goods.

## Condition of Trade.

A PERUSAL of the letters from our jobbing correspondents appearing in this issue affords sufficient evidence that a cheerful and hopeful temper pervades that quarter of the Hardware market. There are few, if any, distributors whose current orders have not been running well above the average for the summer season, while, as stated last week, many are equaling or exceeding last year's phenomenal records. Free movement of seasonable goods is uniformly reported. Jobbers, however, are pursuing a conservative policy in their purchasing, and there is a slackening in the demand on manufacturers and their agents. A few of the latter show a tendency to encourage buyers by shading established quotations, but the great majority hold their prices stiffly, being still occupied with back orders and feeling entire confidence that fall business will be all that they can handle. An exception is found in copper products and lines into which copper enters largely. These reflect the prolonged declining movement in the raw material. On the whole, the trade is likely to benefit from the return of copper to a normal and more reasonable level. The reactionary movement could go considerably farther without reaching figures which would be regarded as unprofitable to producers. In agricultural sections attention is centered on the crops, which are maturing under favorable conditions. Hardware merchants expect that business incident to the harvest will be in volume fully up to the average, and are well stocked with the implements and supplies that will be required by their customers. It would seem that, in spite of unfavorable conditions early in the season, a fair yield of all our important staples is highly probable. Farmers, certainly, show no evidence of discouragement over the situation, and are well supplied with money, which they are spending freely. Indeed, in agricultural sections money is easier and more plentiful than anywhere else. For ordinary mercantile uses it is exceedingly scarce and for business expansion or new projects, even of a distinctly legitimate nature, it is almost unobtainable. Collections are therefore decidedly slow, although in this respect the Hardware trade is probably in better shape than many other branches.

### Chicago.

Trade, like the season, is rather featureless, and likewise disposed toward less strenuous movement. In a few departments, however, there are lines that seem to be but little affected by seasonable or other conditions. Notable among them is that of Wire goods, in which the demand for Nails is apparently insatiable. In spite of all precedent and prediction there has been no appreciable decrease in consumption and, although the mill output is phenomenally large, there is still scarcity at times in Jobbers' stocks of the commoner sizes. Special or less used sizes are difficult to get and orders of this kind are subject to delay. Generally, however, trade is quieter, though perhaps not more so than it usually is at this time of the year. The general trend toward lower prices in crude materials, such as Copper, Zinc, Lead and Pig Iron, has effectually checked the long continued line of advances. Since values had risen to a point that was beginning to obstruct consumption and halt new building enterprises, the reaction noted is welcomed as a direct support to the stability of trade. While here and there rumors are heard of price shading, due to the over anxiety of order seekers in a few lines, there is, on the

whole, a satisfactory degree of firmness in prices in general. Orders for Stoves placed in the spring for fall delivery were in keeping with the high tide of business then undiminished, and manufacturers and jobbers report that shipments of these orders are now going forward with no curtailment. A good business is also reported in Stove Boards, Stove Pipe and Elbows. Just how far and to what extent the telegraphers' strike now on will check business is difficult to say, but should it spread and settlement be long deferred, every industry will be more or less affected, either directly or in sympathy with related interests. The markets are already supporting enough adverse influences and it is to be hoped that this latest burden will be early lifted.

#### Baltimore.

**CARLIN & FULTON.**—The passage of the summer has brought us now to the threshold of another season, in fact we have already entered upon it. But a few weeks ago the country generally was discussing and lamenting the backward spring with its resultant misfortunes. The retail dealers, especially those dealing in textiles, had had the benefit of no spring business, the farming community was disheartened, as the fruit had been killed, the growing wheat injured, and corn and cotton had to be replanted two or three times, and the outlook for the agriculturist was decidedly discouraging. Since then the spring though belated has come and gone, and the heat of the midsummer sun has atoned for the chill and rain of the early season. The wheat crop has been harvested, and in this section the yield has been fine, with a selling price which should satisfy, but we hear that many are holding for what may be impossible figures. The hay crop has never been greater and corn is coming along finely.

The farming community should be and no doubt is in an excellent financial condition, and as all prosperity is said to come from the ground there is, as far as agriculture is concerned, a good basis for future business.

The transportation of the immense crops of grain and cotton, with the general distribution of merchandise all through the country, will again this fall tax the carrying capacity of the railroads to their fullest extent, and it will be a most serious matter if the relations of the corporations to the State and general governments can not be adjusted upon a basis of conservatism and equity.

In regard to prices we must remember that all the elements of the cost of manufacture are higher than for many years. The great activity of the commercial and manufacturing interests has made an immense demand for capital, resulting in high rates of interest. The demand for and the organization of labor have made wages beyond any experience. The enhanced cost of raw materials has also helped in the increased cost of manufactured goods, and until all these factors are scaled down we can expect no depreciation in the value of goods, unless the demand should greatly diminish.

The press has also had its busy season with the daily sensations of labor trials, railroad investigations, "trust busting," &c., and the question is—Where will the lightning strike next? Is the Hardware trade immune? Perhaps—we will see.

#### Cleveland.

**THE W. BINGHAM COMPANY.**—Confidence in the future is the keystone of our prosperity. Isn't it a fact that our confidence is being badly shaken up by some legislation already enacted and more that is being threatened in the future by our lawmakers?

Many of our daily papers seem to think it their duty to publish to the world what dire results are going to come to manufacturers and corporations; that is, thoughtlessly giving out the impression that all are bad and need drastic laws to curb them. Haven't we had enough of this? The country is growing and prospering and there never were so many industries and manufacturing plants doing well as at the present time. Why is it necessary to keep driving into the minds of the common people what calamities are going to come to our industries? Many of our public office holders and office seekers seem to think it is incumbent upon them to make threatening attacks on industries that they know nothing about. Why? Simply

to gather votes for themselves, not stopping to think what wrong impressions might be made on the people.

Trade in all of its branches, Hardware mining, milling and manufacturing is very good in this section. Orders coming through salesmen and by mail are well assorted and for good quantities.

Prices for the most part are steady and firm, but there is a tendency on some lines to advance, on account of the increased cost of material and labor. Many manufacturers who have been obliged to lay in new supplies at advanced prices feel obliged to revise their prices to meet the times. If you consider the cost of material, Steel, labor, and especially Handles, one must conclude at once that the present prices of Shovels, Spades, Coal, Grain and Furnace Scoops are entertaining. We believe we advise our friends and customers correctly when we say:

Purchase from your jobbers who have a supply at present prices, and take them into stock, even though you have to carry some over into next year's business. We believe they are good property. The same is true of many other lines of goods. Many jobbers whose contracts were placed four to six months ago are now receiving their stocks and are willing to divide their profits with customers.

Carriage and Machine Bolts, Lag Screws, Screws, Strap Hinges and Wrought Butts are good property at present prices. A good many orders are being placed for Husking Gloves, Husking Pins, Corn Hooks, Corn Knives, Ice Skates, Snow Shovels and Oil Heating Stoves for fall shipment. Delayed orders are coming in for Elbows, Coal Hods, Stove Boards, Fire Shovels, Dampers, Meat Choppers, Stuffers, Steel Traps, Cross Cut and Buck Saws for fall shipment.

We usually have a very decided cold turn in the weather about September 1, and all the goods mentioned and many others will be wanted quickly. So it is advisable for the trade to place orders early for these goods for shipment immediately or about September 1, so as to insure having them on hand promptly.

Salesmen are sending in many orders for Table and Pocket Cutlery, Scissors, Shears, Razors and Carvers, for shipment at once or in September and October, in order to get the assortment they want. Many dealers realize that they must order early before the assortment is broken. "A word to the wise is sufficient."

#### New Orleans.

**WOODWARD, WIGHT & CO.**—The weather here and throughout Louisiana is hot, with plenty of rain. The crop prospects, from all reports that we get, in cotton, sugar and rice, are improved. The speculative element seems to have different views, and with October, November and December cotton selling at about 12 6-10 cents and spot cotton at 13 cents, it would look as if with even a moderate reduction of the yield, the planters would fare pretty well.

Orders from most of our territory keep coming in very freely. While some of our salesmen and a number of our customers are on vacation the number of orders or amount of business does not seem to have fallen off very materially, but it is not quite as good as it was at this time last year. In Louisiana we seem to have been free from any excitement to take people's minds off of business, which has not been the case with most of our neighbors. The whole State of Mississippi took about a week or 10 days off in voting, counting the votes and awaiting the returns in the John Sharp Williams-Governor Vardaman contest. The heat of this contest and the closeness of the result took up most of the time and attention of the entire business and working community there while the result was in doubt.

Our other neighbor, Texas, is putting into effect its "1907 model" antitrust law, and we are in a quandary as how to act there. We have a few men traveling in the State of Texas and it appears that a drummer selling trust-made goods after to-day becomes a candidate for the penitentiary. We are not quite sure what constitutes trust-made goods, but we know that we have a lot of material in stock made by some of the constituent companies of the United States Steel Corporation and other somewhat similar concerns, and will have to wait

a while to see just how this law is to be applied. Our friends within the State will doubtless learn something about it pretty soon; in the meantime we are liable to miss considerable trade in that State until we know just where we stand.

Building operations in the city of New Orleans and in two or three of the larger cities in the State continue active and the demand for building material and light Hardware is good. Two of the railroad companies are working on large terminals and the demand for contractors' supplies and related material is very good.

#### St. Louis.

**NORVELL-SHAPLEIGH HARDWARE COMPANY.**—We are enjoying very hot weather, with occasional rains. Reports indicate that corn and cotton are making good progress. In the Southern States the corn crop is made.

Vacations are about over and business is settling down to a steady pull. There seems to be little doubt but that all merchants in the West will have a very satisfactory fall business.

In those States where business has been exceptionally good there is danger of the retail dealer overtrading. It is naturally a great temptation, when a merchant sees possibilities of large sales and satisfactory profits to buy a quantity of goods out of all proportion to the amount of capital he has invested.

Then in the hurry of business he does not force his collections, and there is danger that at the end of the year he will find himself widely extended—a large stock of goods on hand, a great deal of money on his books and his creditors hammering him for payments. Therefore as the fall of the year approaches and collections are made, the retail trade should not overlook the great importance of making close collections.

It is also a good idea just before his fall business for the retail dealer to go carefully over his stock, select those goods on which he is overstocked, poor sellers, &c., and arrange some plan to sell these goods during the good selling months. Now is the time to do this. He should not wait until fall business is over and then complain because he has too many of certain kinds of goods.

He should call a meeting of his clerks, ask for suggestions, make up a list of the slow goods, get these goods to the front and then see that every clerk does his part to move the stock. It is not always necessary to cut prices on such goods; often if they are simply given more prominence they will move in a natural way, at the usual profit.

If during the summer and vacation season you have permitted your clerks and yourself certain relaxation, now is the time to remind them and yourself that the days for playing are over, and that all should get down to Brass Tacks, and by foresight, energy and intelligence, get the very most out of the fall business.

The year naturally falls into two divisions: spring trade and fall trade. Between these divisions, at the time of the Christmas holidays and then at the summer vacation season, there is a resting or breathing spell. During these times those who are in charge of a business can do their best work in outlining plans for the coming campaign. Every business, like every battleship, should clean its decks and be prepared before going into action.

#### Nashville.

**GRAY & DUDLEY HARDWARE COMPANY.**—Business conditions in this part of the country continue very satisfactory. Crops throughout the South are going to be much better than anyone anticipated. Prices for all farm products are high and farmers all have plenty of surplus funds. Merchants and manufacturers are very busy for this season of the year. All the factories throughout this part of the country are running full time and have orders ahead.

The retail dealers of the South are buying liberally and are carrying large stocks of goods. The jobbers of Nashville and other Southern cities advise us that business will be fully as good if not better this summer and fall than it was last year. Prices are firm and well maintained. Collections are up to the usual amount for this season of the year.

#### Louisville.

**BELKNAP HARDWARE & MFG. COMPANY.**—The market in Hardware, Iron and Steel products is steady and strong, without any speculative tendency. The experience of former years, however, has taught dealers the necessity of ordering their goods far enough in advance to have them ready when the actual demand comes. This demand seems earlier than usual this year, long before the vacation season is over, which depletes the office and order force. Orders have begun to swell and everybody is put to it, we believe, to get the goods out promptly enough to suit exacting customers.

The vacation problem does not grow less in seriousness year by year. On the contrary, the demand for absence has become more and more universal, and even domestic help, which in the old days confined its holidays to Sunday School picnic excursions or the fraternal outings of the "Sons and Daughters of the Morning," now count on having anywhere from two to four weeks in which to rest up. There is no doubt about the desirability of it for the individual and for the business world at large. We believe that the Hardware jobbers would be the last to interpose an objection. The writer, when in New England a few weeks ago, noted on some of the department stores, "This store closes all day Saturday, in order that the employees may have their week's end outing." We did not have time to inquire whether this running through a series of two or three months takes the place of two weeks' vacation or not, but we presume that it did, as it amounts to about the same thing. If some kind directing power could arrange so that the great swell and tide of business should rise after the temptations put forth by the railroads in the shape of low round trip excursions in July and August had come to an end, it would be a welcome change to most of us, we are sure.

Trolley cars radiating in every direction, automobiles of multiplied horsepower, all of these make suburban life more and more attractive, so that those who can afford it get their vacations strung out piecemeal by living in the country. The surprising interest manifested in all sorts of athletic sports infests not only the young but those somewhat advanced in life. The palpable endeavor to counterfeit youth by going bareheaded in a rushing motor car is a well recognized subterfuge and the lingo of the golf links is current everywhere.

#### Portland, Oregon.

**FAILING, HAINES & McCALMAN.**—Business continues good, though there has been a slight falling off, due to the usual summer dullness. This, however, has not been as great as everybody expected in our line, and is rather more in the city than in the country trade, where it would reasonably be expected.

We are all looking, however, for an unusually good season with the opening of the fall trade, as all crops look remarkably favorable, and we expect good prices. The one exception to this is the hop crop, which, however, affects a small territory.

There is one circumstance which may possibly affect the Portland jobbers in our line, but will more nearly touch those on Puget Sound. The Northern Pacific and Great Northern roads have announced a new schedule on lumber, which it is anticipated will curtail the market of the Washington lumbermen very greatly. This will, of course, affect all Hardware dealers seriously, but there are indications which would seem to show that conditions will not be as bad as is feared. This will not affect the territory served by the Harriman lines, unless conditions change, and will not affect the immediate Portland territory very seriously, as a great part of our lumber is shipped by water.

Two new territories, directly tributary to Portland are being opened by railroads, and will probably be in operation within a year. One of these is the Tillamook country, a wonderful dairying and lumber region, nearly directly west of Portland, on the Pacific Ocean, which should be reached in 2 hr. or less from this city. This country has never been properly traveled by Portland merchants and is as yet very sparsely settled. It will afford wonderful opportunities for anybody with a small

capital who wishes to go into any kind of mercantile business or into farming.

The other country is that on Coos Bay, nearly directly west of Eugene, a point about 125 miles south of Portland. On account of better steamer service this territory has been almost monopolized by San Francisco jobbers, but now with a direct railroad from Portland the Portland jobbers hope to do a great deal of business in it. While better developed than the Tillamook country the Coos Bay region is no wealthier, but will afford almost as good opportunities for intending settlers. Either of these districts cannot be surpassed in opportunities for newcomers.

### NOTES ON PRICES.

**Wire Nails.**—The demand is active, and more or less delay in shipments continues. Steel is scarce, which contributes to the difficulty in filling orders promptly. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

**New York.**—The demand continues good for the season, the falling off anticipated by some in the trade not having materialized as yet. Jobbers' assortments are somewhat broken on some sizes this week, owing to delayed shipments from mill. The local market is generally maintained, except that sometimes Hardware jobbers sell Nails at less than regular quotations. New York jobbers' quotations are: To retailers, carloads, on dock, \$2.19; less than carloads, on dock, \$2.33; small lots at store, \$2.30.

**Chicago.**—The August business of the American Steel & Wire Company is so far not quite up to the phenomenal record of the corresponding period of last year, when fear of an advance in price influenced the placing of unusually heavy orders. Buying at the present time is not at all speculative and represents actual needs. Shipments, though large, are still more or less delayed. Quotations are as follows: \$2.18 in car lots to jobbers and \$2.23 in car lots to retailers, with an advance of 5 cents for less than car lots from mills.

**Pittsburgh.**—Some little time ago some of the Wire Nail mills were catching up on deliveries, but recently the demand has increased materially in spite of the lateness of the season, and the mills seem to be getting further behind on shipments. The scarcity in Steel also continues, but is not as bad as some time ago. Prices are unchanged but very firm, and it is claimed that some of the smaller Wire Nail mills are able to get premiums for prompt shipments. Quotations are as follows, f.o.b. Pittsburgh, plus actual freight to point of delivery, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads, to jobbers.....	\$2.00
Carload lots, to retail merchants.....	2.05

**Cut Nails.**—A scarcity of Nails is still interfering with prompt shipments from mill, caused in part by the difficulty in obtaining steel. Until old contracts are exhausted jobbers will be in a position to sell on the old basis of prices. It is understood that mills are generally charging the prices adopted July 31. Quotations are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.10; less than carloads, to jobbers, \$2.15; less than carloads, to retailers, \$2.25. Iron Cut Nails at points west of and including Buffalo and Pittsburgh are held at 10 cents advance on Steel Cut Nails.

**New York.**—There is a satisfactory demand in the local market, but jobbers find it difficult to obtain prompt shipments from mill. Prices are generally maintained, except as Hardware jobbers sometimes cut prices. New York jobbers' quotations are on the basis of \$2.30 for small lots at store.

**Chicago.**—The demand is quite good for the season. Owing to the temporary idleness of several mills there is some scarcity on certain sizes. Until old contracts are exhausted there will likely be some selling on the basis of former prices, though it is expected that in the main the new schedule will be adhered to. Quotations

are as follows: Iron Cut Nails, car lots, to jobbers, \$2.38; to retailers, \$2.43; Steel, to Jobbers, in car lots, \$2.28; to retailers, \$2.33.

**Pittsburgh.**—There is a fair demand for Cut Nails, considering the season, and some of the mills still report trouble in getting prompt shipments of Steel. The car supply is better than for some time, and there is little complaint on this score. Prices continue to be cut to some extent by jobbers, but the mills are generally adhering to the prices adopted on August 1, which are as follows, f.o.b. Pittsburgh: Carload lots, to jobbers, \$2.10; less than carloads, to jobbers, \$2.15; less than carloads, to retailers, \$2.25.

**Barb Wire.**—Shipments from mill are unusually heavy for the season, owing to specifications on contract orders. New business is comparatively light. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

**Chicago.**—Complaint of backward deliveries is still heard, but the heavy shipments being made by the mills ought soon to meet requirements, since new business is not accumulating rapidly. We quote as follows: Jobbers, Chicago, car lots, Painted, \$2.33; Galvanized, \$2.63; to retailers, car lots, Painted, \$2.38; Galvanized, \$2.68; retailers, less than car lots, Painted, \$2.50; Galvanized, \$2.80; Staples, Bright, in car lots, \$2.30; Galvanized, \$2.60; car lots, to retailers, 10 cents extra, with an additional 5 cents for less than car lots.

**Pittsburgh.**—There is still a fair amount of new business being placed, although the season is about over, and specifications on contracts are still coming in freely, shipments by the mills being much heavier than usual at this season of the year. Prices are firm but unchanged. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Gal.
Jobbers, carload lots.....	\$2.15	\$2.45
Retailers, carload lots.....	2.20	2.50
Retailers, less than carload lots.....	2.30	2.60

**Smooth Fence Wire.**—The volume of business being handled by the mills is large, owing to specifications on contract orders and the placing of heavy contracts for forward delivery. The market is firm. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.85
Retailers, carloads.....	1.90

The foregoing prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

6 to 9	10	11	12 & 12½	13	14	15	16
Annealed.....Base.	\$0.05	.10	.15	.25	.35	.45	.55
Galvanized.....\$0.30	35	40	45	.55	.65	.85	1.15

**Chicago.**—The volume of fall business coming in from Fence makers is highly satisfactory, as are the specifications now being received on former contracts. Users of Wire in all lines are extremely busy. Quotations are as follows: In car lots, to jobbers, \$2.03 f.o.b. Chicago, and to retailers, \$2.10.

**Pittsburgh.**—Fence manufacturers all over the country are still placing heavy contracts for Fence Wire for fall delivery, the tonnage entered by the mills so far being much larger than at this time last year. Specifications on contracts placed some time ago continue to come in liberally, and shipments by the mills are heavy. The Steel supply is not satisfactory by any means, but there is little complaint now over the shortage of cars. We are advised that official prices are being rigidly held. Quotations are as follows, f.o.b. Pittsburgh 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads.....	\$1.85
Retailers, carloads.....	1.90

The foregoing prices are for base numbers, 6 to 9.

**Wrought Iron Goods.**—The market for Hooks, Hasps, Staples and kindred goods is unchanged and manufacturers report an excellent demand. A general quotation on this line is 90 per cent. discount.

**Axles.**—The season for booking contracts on Axles finds the market in an unusually satisfactory condition from the viewpoint of the manufacturers. For the past two years or more prices are said to have been rather unremunerative, but an upward movement has recently developed, forced, the producers assert, by heavy increases in productive costs. Contract orders for the season of 1907-1908 are being taken at figures ranging not less than 15 per cent. above the former level, and bookings are heavy as jobbers and consumers do not question the justification of higher prices. Considerable uniformity is shown by the quotations of different manufacturers who are believed to be acting harmoniously. Current demand for Axles is referred to as unusually good, and prospects are excellent for a large volume of business.

**Hog Rings and Ringers.**—Owing to the advance in material and labor, the manufacturers of Hog Rings and Ringers advanced prices 25 cents per gross on all Rings and Ringers, on July 16. According to manufacturers there has been practically no money in the business at ruling prices, while the demand has been decreasing steadily the last few years owing to new devices on the market which have been taking the place of Rings for Hogs. It is not considered improbable that a further advance may be made in Ring and Ringer prices later in the season.

**Bolts, Carriage and Machine.**—While some manufacturers of Bolts are still well supplied with orders there are quarters in which slight concessions are being offered, especially on larger sizes and on rolled thread goods. On the whole the market could hardly be referred to as weak and prices may stiffen after the summer dullness is over.

**Scale Beams.**—The line of Scale Beams is commanding some attention in the South, as a short cotton crop is likely to develop some weakness in prices. This would first become evident in the quotations of jobbers who may have purchased rather liberally earlier in the season and feel disposed to reduce their stocks.

**Tea Kettles, Wash Boilers, Etc.**—Some reflection of the decline in Copper is found in quotations on nickel plated Copper Tea Kettles, Tea and Coffee Pots and Copper Wash Boilers.

**Bright Wire Goods.**—A slightly easier tendency is noted in quotations on Bright Wire Goods, both brass and iron. This is apparent from the fact that smaller buyers are able to purchase close to the extreme prices scheduled by the manufacturers. Business is rather light in volume, the largest buyers being disinclined to purchase except at moderate concessions.

**Copper Products.**—The market for raw and manufactured Copper and related goods is in the same state of uncertainty and inactivity that has characterized it for several months. Nominal prices for ingot Copper can be shaded considerably for business of any volume, but trading appears to be confined, as heretofore, to actual necessity. While the base prices in Copper and brass commodities are unchanged, shrewd buyers can obtain concessions for any business that is at all attractive.

**Coil Screen Door Springs.**—Manufacturers of Coil Screen Door Springs, often referred to as Perfection Springs, are soliciting contracts from the larger trade for next season's requirements. Quotations reported would indicate that these goods are likely to cost the retailer from 15 to 25 per cent. more during the coming year. Prices have ruled very low for some years, so low, in fact, as to discourage production on the part of a few manufacturers. These houses, however, may take a greater interest in the market next season as an effort seems to have been made by the larger factors to establish some sort of uniform scale of quantity prices, the discounts mentioned ranging from 20 per cent. upward.

**Leather Belting.**—There has been some recession in hides and butts, leading to a shading of quotations by a few manufacturers on competitive grades of Leather Belting. Hides that come into the market at this season of the year usually sell at a slightly lower price as they are inclined to be grubby. Trade has fallen off some

what, although not unduly, for the summer months. Prices hold comparatively firm, on manufacturers' standard brands of Belting and a general stiffening in the fall is not unlikely as there is every prospect of an excellent demand.

**Rope.**—The demand is comparatively light and considerable energy is displayed by manufacturers in soliciting business. Under these conditions card prices, represented by the following quotations, are not adhered to in all instances. Quotations are as follows: Pure Manila, 13 and 13½ cents; B quality, 12 to 12½ cents. Pure Sisal, 9½ cents; No. 2 quality, 7½ to 8 cents; No. 1 Jute, ¼ in. and up, 9 cents; No. 2 Jute, 8½ cents.

**Window Glass.**—At a meeting held last week by representatives of Glass jobbing firms throughout the Central and Middle West, prices were reaffirmed. It is stated that jobbers are avoiding as much as possible buying Glass of manufacturers and are reducing their stocks as much as they can, even to buying and selling to one another. This is in view of the fact that a resumption of Glass making September 1 would result in a demoralized condition of the market. It is pointed out that there could be no general resumption of factories as early as that, as no fires are yet lighted and that a large majority of plants have not even made their annual repairs. Delaying the start a few weeks will allow manufacturers' stocks to be cleaned up to a greater extent and would also strengthen the workers' position. A joint meeting of manufacturers and workers is scheduled for the present week to consider a wage scale for the coming fire. Manufacturers are opposed to the adoption of a flat scale, while the Amalgamated Association of Workers is understood to have instructed its Wage Committee to adopt nothing but a flat scale, and to have recommended that at least as high wages be provided for above three bracket Glass as was paid last year, with an advance of from 10 to 25 per cent. on the first three brackets. It will be difficult to harmonize these conflicting views, if both sides remain firm in their convictions. Manufacturers as a rule see their only salvation in a sliding scale of wages. Manufacturers are alluded to as having comparatively light stocks of Glass on hand and as quoting only from broken lots, while they are not able to fill an average order complete. Prospects for fall business in the Middle West are regarded as encouraging. In Greater New York jobbers' quotations from jobbers' list, October 1, 1903, are 90 and 15 per cent. discount on all sizes, single and double strength. Western jobbers are quoting from the same list as follows: 90 and 10 per cent. discount for the first three brackets of single thick; 90 and 15 per cent. for other brackets of single thick and 90 and 20 per cent. discount for all sizes of double thick.

**Spirits Turpentine.**—Prices have advanced ½ cent per gallon and fallen off the same amount during the week, so that they are now the same as those quoted last week. Local demand is light. New York quotations are as follows, according to quantity: Oil Barrels, 59 to 59½ cents; Machine Made Barrels, 59½ to 60 cents per gallon.

**Linseed Oil.**—Buying is confined to small jobbing lots and this is in restricted volume. Large buyers are not attracted by quotations and are unwilling to place contract orders on the present basis. Crushers have an abundance of Oil on hand, but cannot afford to sell it at less, owing to the price paid for the seed from which it was made. The prospects are that the Flax Seed crop will be a record breaker this year and on this assumption large buyers are holding off supplying their future requirements in Oil. The crop will not be considered free from damage by frost much before September 1. Crushers are holding up prices in view of a possible damage to the crop and also of an anticipated foreign demand for seed. The foreign requirements for American seed cannot be determined much before December, as about that time the Argentine and Indian new Flax Seed crops are on the market. The present condition of the seed market shows little fluctuation and is quiet. New York quotations for oil, according to quantity, follow: City Raw, 43 to 44 cents per gallon, according to quantity and seller; Out of Town Raw, 40 to 41 cents per gallon; Boiled Oil is 1 cent a gallon over Raw.

## The Policy of Our Store.

BY FAR WEST.

EVERY store has a policy which it pursues either from a definite settled purpose or unconsciously. This policy, whichever it be, has much to do with the estimate placed upon it by the community. The policy of a store springs largely, if not entirely, from the personality of its head. If a bustling, energetic man is at the head of things the business is inclined to go forward with much noise.

### A Strong Personality.

IN OUR STORE the character of the Head dominates its policy in a remarkable degree. Possessed of an easy, quiet manner, and a courtesy of the old school, the business moves along in an easy, quiet manner, without friction. Not being immune from mistakes, an irate customer is referred as a matter of course to the Head. In a short time he leaves the office shorn of his quills. There are no written laws for the guidance of the clerks; the policy of the Head has permeated the very soul of the working force, to which he is not the boss, nor the old man; simply the Head.

### Courtesy to High and Low.

Located in a section of the country where the Japanese has taken the place of the Chinaman in the esteem of the citizens, the despised Jap is treated with the same courtesy and attention as his white brother. The courtesies extended and the favors demanded by some of the customers are carried to the brink of imposition, but the proportion is so infinitesimally small that it speaks well for the community as a whole.

### Methods of Advertising.

It is not the policy of the Head to advertise largely by the use of printers' ink—an ad. changed once a week in the town paper constitutes his effort in that line—claiming that a satisfied customer being the best advertisement he would rather lose the goods than the customer. This policy makes OUR STORE a particularly easy mark for the designing. The question of guaranteeing goods has long been a settled matter, as under this policy

### Anything Can Be Returned

at any time. A ranch customer having a stock sale and giving a free lunch, requests the loan of a gross of tin cups. The cups go out in neat packages of a dozen in each; they are returned in bulk, unwrapped, and showing signs of use which make them unsalable as new goods. The loss is charged to advertising. A lady wishing to make her trunk secure is shown the  $\frac{1}{4}$ -in. Sisal usually sold for that purpose. She has half understood the kind of rope suggested by a friend and insists upon buying  $\frac{3}{4}$ -in., as the trunk is to bump on the rope! The rope is cut and delivered. It is also quickly returned. Her friends laughed at her, and could we not take it back and make halters of it?

The rope is taken back without question and the money refunded, and another charge made to advertising. In two weeks that customer would be two thousand miles from here, but that possibility did not affect the policy of OUR STORE. A customer complains that the ring of a Hot Plate sold him is broken; he intimates the gas fitters *might* have hit it with a hammer, but this makes no difference to the Head. The exchange is made and another charge goes to the account of advertising. It is the policy of OUR STORE to sell builders' Hardware at actual cost, on the ground that a consumer of builders' Hardware will be a profitable customer on other lines.

### Recognition in the Community.

The question naturally arises—In what esteem is a policy of this kind held by the community and how does it affect business? As a trade magnet the answer comes in the person of the gas plate customer returning in a few days and placing his order for complete outfit for his laundry—Washing Machine, &c. Another answer is given by a banker—Money is tight, banks are besieged by eager borrowers only to be turned away. A rumor is out that the Head is going to build. To him the

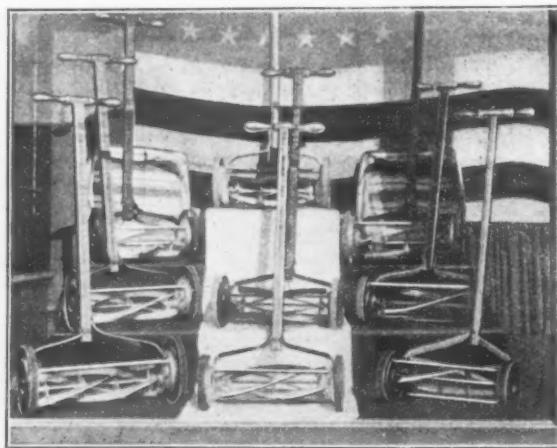
banker comes offering to loan all the money required. The shadow of death falls upon the household of the Head. The hour of the funeral services all the Hardware stores close their doors and not a nail is to be had in town for one hour.

### A Rigorous Schooling.

Commenting upon his policy the Head observes that it was a design he had when he entered business, but that it took some time to school himself. He was greatly helped by observing that goods taken back unwillingly or money refunded after argument, lost their virtue and the object wanted—a satisfied customer. Doing the unpleasant duty cheerfully and with a smile as though he enjoyed it has made his policy successful and his store known all over the community as the *Old Reliable*.

## LAWN MOWERS IN THE WINDOW.

THE illustration herewith is of a Lawn Mower window display recently made by the Knapp-Cramer Hardware Company, North Tonawanda, N. Y. The company's windows are 6 x 9 ft. in dimensions. Steps like a pyramid were built, on which the different styles were placed promiscuously, with the exception of one, which was given the place of honor on the top and bore



Lawn Mower Window Display of Knapp-Cramer Hardware Company.

a card with the inscription, "Above all others." The prominence given this Mower was due to the fact that the company was especially desirous of disposing of its stock of this machine. That the display accomplished its purpose is evident inasmuch as in less than a week all Mowers of this type were in the hands of purchasers. The steps of the pyramid were covered with green and white cloth. As the company's windows are open at the back a curtain of dark green cloth about 3 ft. high was used as a background.

## F. E. MYERS & BRO.'S CATALOGUE.

F. E. MYERS & BRO., Ashland, Ohio, have just issued F. catalogue No. 43, showing their complete line of Pumps, Hay Tools, Barn Door Hangers, &c., 363 pages being occupied in the representation of the company's extensive assortment of these goods. The catalogue illustrates and describes many kinds of Well Pumps, House Pumps, Power Pumps, Spray Pumps, Cylinders, Hay Carriers, Steel Track, Hay Forks, Pulleys, Hooks, Store Ladders, Stayon Door Hangers, Rack Irons, Bicycle Stands, &c. The opening pages of the catalogue are embellished with views of their finely equipped plant and exhibits at the St. Louis World's Fair.

The Bell-Marrott Hardware Company, Delaware, Ohio, has changed its name to the Buckeye Hardware & Iron Company. John H. Schlaaf is president of the company and F. M. Marrott secretary.

## There's Good in Most of Them.

*A Hardware story of a wise and tactful merchant, a grouchy manager and a bright, young clerk, who failed at first, but was finally encouraged to do his best, and proved a valuable employee.*

BY WESTMOUNT.

**S**HUT the door, Bob, and sit down; I want to have a talk with you.

"Now, without any unnecessary beating about the bush, I want to say that I'm greatly disappointed in you. I don't know whether you imagine you're underpaid, or what the trouble is, but Mr. Mannering has been complaining to me for some time that your work was not satisfactory.

"As you are well aware, I have too many other things to attend to, to keep as close a watch on my employees as I should do; but, nevertheless, I am pretty well posted as to who is doing his best and who is not. Now, when you started here a year ago, you knew practically nothing about the Hardware business, but you seemed so eager to learn that I started you in at a figure a little higher than I generally pay green hands. I also promised you an increase as soon as your work merited it. I have been thinking the matter over for the past few days, and have come to the conclusion that you are either stubborn and will not do the best you

**Plain Talk.** can, or you are lazy. Now, it's not the policy of this house to keep any loafers hanging around. I've put off saying anything to you before, hoping that you would improve and take some interest in your work, but you seem to have no intentions of doing so.

"Now, don't say anything now that you may regret in an hour. Go home to-night and think over what I've said and come in to-morrow afternoon and we'll see if we can't come to some sort of an understanding. I never let a man go providing it is at all possible to keep him, and I don't want to have to make any exception in your case. Go and do as I say, sleep over it and come in here to-morrow. That's all for the present."

\* \* \* \* \*

"Frank, ask Mr. Mannering to step in here for a minute."

"I've just been talking to young Evans, Mr. Mannering."

"Yes, sir."

"I didn't say much to him, but I think I gave him to understand that he has to make good here or get out. I told him to think it all over, and come in to-morrow and talk it over with me."

"I think you're only wasting your time over him, sir. I'd advise discharging him at once. He's not the kind of clerk who will get along here. He's too high toned for a Hardware store."

"Quite right. I know very well that he has his faults, but you must also admit that he's smart, and I really think that if handled right he should turn out a very valuable employee. I've always prided myself on the fact that I could get the best out of my clerks that there was in them, and to give up in this case would be to acknowledge defeat. No, I think I'll give him another chance. However, I'll let you know to-morrow, after I've had a talk with him."

"Very well, sir."

\* \* \* \* \*

"Well, Bob, have you thought over what I said to you yesterday?"

"Yes, sir. I've come to the conclusion that I'd better get out."

"Get out! Why, what's the matter? Are you going to give up without a struggle? I thought better of you than that."

"It's not because I can't make good, but I don't like the work here and can't keep my mind on it, so I might as well go now as any other time."

"That's all rot. No work is pleasant, if it comes to that, and you're as well suited to the Hardware business as any other. I was talking with Mr. Mannering yesterday after you were in here, and we didn't quite agree

over what should be done with you. He was in favor of discharging you at once, while I claimed that I could make a good employee out of you. I therefore decided to give you an increase of \$5 per week, and another

**Buck Up!** chance to prove what you could do. Now, I don't think you'd like me to acknowledge to him that he knows more about my business than I do myself. You go back and do the very best you can, and I'll see to it that your salary goes up as it should."

"Thank you, sir. I'll make good if I break my neck over it."

"Who in blazes wouldn't make good for a boss like that? The old man's all to the good, you can bet your life on that. If it wasn't for that dog Mannering I'd have the best berth in town. He's one of those narrow minded lobsters that can't see farther than his nose. He lives only for his work, and thinks everybody else should do the same. He hasn't got intelligence enough to see that other people can attend to their work and still see that their clothes are kept in decent order. I wish we had a tattle-tale among the crowd that would let the boss know just how he treats the clerks. Well, it's up to me to take all the dirt he gives me now and keep mum just to let the old man know I appreciate what he's done for me."

Let me say here, that this story is founded on fact, and if more proprietors would pay stricter attention to their clerks' natures, there would be more harmony and less changes in the staffs of retail Hardware stores. Mr. Mannering in this case is but one of many such managers or head clerks. A man of not too brilliant intellect, who by giving up nearly all life's pleasures and plodding along in his own narrow rut has climbed up to the position of "general overseer" in a good sized retail store.

Bob Evans, on the other hand, is one of the exceptionally clever kind, to whom work and success come easy. When a clerk like this is under the eye of a man like Mr. Mannering there will always be trouble. A fast horse and an ox don't pull and an **Ox.** well together, neither will a quick witted young man and a dull, slow thinking manager. Employers might save themselves a great deal of unnecessary trouble and worry by finding out the dispositions of their employees and placing them so as to avoid friction. But to proceed with my story.

Mr. Mannering, upon being informed of the outcome of the interview between his employer and Bob Evans, was anything but well pleased, and took no pains to hide his disappointment upon finding that the young man instead of being discharged, had received an increase. He went so far as to bring down on his own worthy head some words to the effect that he was not yet the head of the concern. This did not tend to improve his temper, and he left the private office with thoughts of the many unpleasant jobs our friend Bob would perform in the near future to balance the account he had against him.

Our merchant, however, was a man of keen perception, and after putting two and two together came to the conclusion that his two employees were not as good friends as they might be, and decided to keep a pretty close watch on proceedings in the near future. He therefore spent more of his time than usual around the store, with the result that he saw Bob several times

**Dirty Work.** humiliated before customers, by the manager breaking in in the midst of a sale with:

"I'll attend to this sale, Mr. Evans. You might weigh out 10 lb. of Nails for Mr. ——. Hurry up, too, the carter's waiting."

This state of affairs kept going on for some time, but human nature will not stand it for very long. Several times Bob's resignation was written out, but each time he thought of his promise to make good and tore it up without handing it in.

One day a young lady came in to buy a Tennis Racquet, and Bob, who happened to be near the front of the store, stepped up to serve her. Now, the firm was selling a special line of Racquets, which netted it a good profit. This line was rather cheap, and was mostly bought up by children to play ball on the street. Ordinarily, Bob would have tried to sell one of these Racquets,

as the firm made more on them than on the standard lines. However, the young lady was extremely pretty and didn't know much about Racquets. She confided to Bob that her sister was a tennis fiend, and that she had a beautiful set of Racquets given her last summer, but had broken the 12-ounce one. The sister's birthday would come around very shortly, and she would like to give her a good 12-ounce Racquet, but would like him to advise her what make was the best.

Bob told her that a certain Racquet could always be relied upon, and was about as good as any outside those that were made to order. She decided to take this Racquet, but upon looking through the **Selling a stock** Bob found that he had everything **a Racquet.** but a 12-ounce. He told her so, but promised to have it if she would call the next day. She was on the point of leaving, when Mr. Mannerling, who had been watching from some distance away, stepped up.

"Mr. Evans, if you'll dust the showcases, I think I can find the young lady what she desires."

Bob didn't know exactly what to say, but the young lady herself seemed to divine how matters stood, and came to his rescue by thanking Mr. Mannerling, and saying that she was perfectly satisfied with the arrangement that had been made, and hoped that Mr. Evans would be sure and get her the Racquet to-morrow.

After she had gone, Bob went and wrote out his resignation once again, and put it carefully in his inside pocket. He then walked over to where the manager was looking over new goods, and said loud enough for the other clerks to hear:

"Mr. Mannerling, I've stood quite a lot of dirt from you since I've been here, especially during the last two months. I promised the boss I'd make good here, or you would have heard from me before. I can stand quite a lot from you, because you're not responsible for half you do, but to-day you passed the limit. My resignation goes in to the boss to-night, but in the meantime I have a little account to settle with you. I'm going to give you the worst licking you ever got in your life. You can take off your coat, and come out in the yard, or take it here. You have five minutes to make up your mind."

Things would have been exceedingly interesting very shortly, had not the boss himself appeared on the scene and asked Mr. Mannerling to step into the private office. He was the first. The whole staff walked the carpet that day, Bob being the last one called. He went in with the resignation in his hand. The boss took it and tore it up without reading it.

"Bob, I've decided to open up a large Sporting Goods department, and I want you to run it for me. This will be run separate from the rest of the store, and you will have absolute control. You can pick out

**A New Department.** any clerk in the store for your assistant. Your salary will be \$25 per week.

"No, don't thank me. I want you and Mannerling to shake hands and make up. He's not a bad fellow, but he didn't understand you any more than you did him. I've had a long talk with him, and he's promised to beg your pardon for any bad turns he's done you in the past. You'll find him outside waiting for you."

KEENE JACKSON, secretary of the Kansas City Roofing & Corrugating Company, Kansas City, Mo., died on the 4th inst. from Bright's disease. Mr. Jackson was born 45 years ago in Scott County, Kentucky, and moved with his father's family to Tipton, Mo., in 1879. Two years later he came to Kansas City and entered the employ of the Standard Implement Company, later going with Parlin & Orendorff, with whom he remained for 12 years. Getting out of the Implement business he accepted the position which he held until his death, with the Kansas City Roofing and Corrugating Company, of which his brother-in-law, Jerome Twitchell, is president. Mr. Jackson is survived by a widow and one daughter.

## THE AMERICAN FORK & HOE COMPANY.

**T**HE AMERICAN FORK & HOE COMPANY, Cleveland, Ohio, announces that its Catalogue F will continue in force for the coming season, ending June 30, 1908, with changes embodied in a supplement to the catalogue lately issued. Among the changes noted in the supplement is the addition of Steel Garden Trowels, Abbott Dock Cutter, enlarged list of Beet Hoes, including 6½ to 8 in. blades, Mortar Mixers, with four holes; Phosphate Forks and Strap Ferrules on Street and Mortar Hoes. The numbers on Steel Potato Hooks have been changed. The following articles have been discontinued: Rough and Ready Riveted Sheet Steel Hoes, Malleable Floral Shovels and Rakes, Eight-Tooth Steel Rakes, and Rough and Ready Malleable Garden Rakes. Lists have been changed on Ivanhoe, Columbian and Washington County Hoes.

## TRADE ITEMS.

ANNOUNCEMENT is made by the Navy Department, Bureau of Supplies and Accounts, that bids will be opened in Washington, August 27 and September 3, for a quantity of material, which includes the following items of interest to the Hardware trade: Bolts, Nuts and Washers, Hack Saw Blades, Twist Drills, Handles, Butt Hinges, Blocks, Step Ladders, Paint Burners and Torches, Spikes, Shovels, Screws, Lathe Tools, Emery Wheels, Wheel Barrows, Hose and Packing, Pipe and Fittings, Metals, &c.

RICHARD A. CULTER, president of the Culter & Procter Stove Company, died recently at his home in Peoria, Ill. Mr. Culter was born in Brown County, Ohio, April 27, 1830, and his first experience in mercantile business was acquired in a Hardware store at Ripley, Ohio. He came to Peoria in 1855, where he established a business in Heavy Hardware. A few years later he became associated with James Selby in the manufacture of Corn Planters. The firm of Culter & Procter was organized for the manufacture of Stoves in 1864, and, 18 years later, after the death of Mr. Procter, the business was incorporated with Mr. Culter as president, in which capacity he continued to serve until his death. He is survived by a widow and three sons.

J. FRIEDENSTEIN, managing director of the South British Trading Company, 13-15 Wilson street, Finsbury, E. C., London, England, sailed for home on the 13th inst. Mr. Friedenstein arrived in this country in April, and since that time has traveled extensively, visiting manufacturers whose lines are already represented by the company and conferring with others with a view to securing their accounts. As a result of his trip, Mr. Friedenstein has secured the following new accounts: P. & F. Corbin, New Britain, Conn.; Kelly & Jones Company, Pittsburgh; Chicago Spring Butt Company, Chicago; Atha Tool Company, Newark, N. J.; Standard Scale & Supply Company, Pittsburgh; Royersford Foundry & Machine Company, Royersford, Pa.; National Caster Company, Hamilton, Ohio; E. F. Reece Company, Greenfield, Mass.; De Haven Mfg. Company, Brooklyn, N. Y., and Lyman Gun Sight Corporation, Middleford, Conn. The South British Trading Company is well equipped for the representation of American manufacturers, and its staff of traveling salesmen covers all parts of England, Scotland and Ireland. Among manufacturers whose products the company has been pushing for some time are the Coldwell Lawn Mower Company, Newburgh, N. Y.; Corbin Cabinet Lock Company, New Britain, Conn.; Diamond Saw & Stamping Works, Buffalo, N. Y.; Griffin Mfg. Company, Erie, Pa.; J. Stevens Arms & Tool Company, Chicopee Falls, Mass.; Bemis & Call Hardware & Tool Company, Springfield, Mass.; Savage Arms Company, Utica, N. Y., and Novelty Mfg. Company, Jackson, Mich.

A Hardware store is to be started in Texico, N. M., by a copartnership, of which J. Porter, R. E. Maddux and O. M. Conley are members.

## The Trades 100 Years Ago.

### Third Article.

*The following article with the accompanying illustration is taken from the "Book of Trades, or Library of the Useful Arts," which was published in 1807 by Jacob Johnson, London, and at that time for sale in his book-stores in Philadelphia and Richmond, Va.*

### The Iron-Founder.

Although iron is not esteemed the most precious metal it is beyond all question the most useful. It is employed in three different states, each having peculiar properties, by which it is applicable to various purposes.

The first is cast iron, the second wrought or malleable iron and the third is called steel.

Our business at present is with the cast iron manufactory, of which we have a presentation in the plate. The founder has just taken from the furnace a ladle full of liquid metal, with which he is going to cast perhaps



Ironfounder

the front of a stove or some other article, the form of which is molded out in stiff sand. It will be readily conceived that this business requires great strength, and a constitution that will bear a vast degree of heat.

Iron is dug out of the earth in the form of stones, and in this state it is called ore. The richest ores—that is, those which yield most metal—are heavy and of a brownish color, inclining to a red.

Before the metal can be extracted the ore must be roasted or calcined; that is done by a different process in different places; at the iron works in Staffordshire, after the ore is dug, they calcine it in the open air with small charcoal wood or sea coal, in order to break it in small pieces. This process requires three days. But at Forest-Dean, in Gloucestershire, the ore is calcined in kilns made like common lime kilns. These are filled up to the top with coal and ore, one layer upon the other alternately, and then setting fire to the bottom layer of coal it

burns till the coal is wasted away. By this means the ore becomes brittle, but the metal is not fused:

It is now taken to the furnace to be melted, or, as it is usually termed, to be smelted—that is, to extract the metal from the dross. The furnace, such as is represented in the plate, is built of brick, and is about twenty-four feet square on the outside, and near thirty feet in height within, the middle or widest part of which is not above eight or ten feet, the top and bottom being brought into a narrower compass, something like the shape of an egg. Behind the furnace are fixed two pair of bellows, which are worked by means of a water wheel, and they are contrived so as to play alternately, the one giving its blast while the other is rising; but in many foundries the bellows used are constructed after Mr. Wilkinson's plan, by which a regular and uniform blast is produced. Holes are left in the furnace, which may be opened at any time to take away the scoria or dross, or to permit the metal to flow out.

The furnace is filled with ore and charcoal or coke, and sometimes limestone is added as a flux. The ore gradually subsides into the hottest part of the furnace, where it is melted, and the metallic parts being the heaviest fall to the bottom, where there is a passage made for the purpose of taking off the scum. As soon as there is a sufficient quantity of fusion it is let out by a tap hole into furrows made in an immense bed of sand that lies before the mouth of the furnace; the large mass, which sets in the main furrow, is called by the founders a sow, and the lesser or side furrows are termed pigs of iron. The metal is generally made so hot before it is drawn off that it will not only run to a great distance, but will keep boiling for some time in the sand.

For chimney backs, hearths of ovens, the fronts of stoves and other small articles the founder takes the metal out of the receivers in large ladles, from which he pours it into molds of fine sand.

When the furnaces are once at work they keep them constantly employed for many months together, never suffering the fire to slacken night or day, but still supplying the wasting of the fuel and the ore with fresh materials poured in at the top.

The excessive and long continued ignition kept in these furnaces gradually wastes the brickwork till the sides, which are many feet thick, become unable to sustain the weight of the melted metal, so that it has sometimes been known to burst out suddenly in a violent and dreadfully destructive stream. At certain intervals, therefore, the fire ought to be allowed to go out, whatever may be the expense of rekindling it, in order to examine and repair the furnace.

Three tons or 6000 pounds of iron are sometimes run off in 24 hours, with the application of the bellows, while the heat without these would scarcely melt a single hundredweight in the same time.

THE LUTTRELL HARDWARE COMPANY, Brewton, Ala., has issued a catalogue of vest pocket size and containing nearly 200 pages. It is principally devoted to the official price-list of Sash, Doors and Blinds adopted October 15, 1903, the company doing an extensive business in this line, but also calls attention to a few selections from other lines carried in stock.

## GOOD SIDE LINES A NECESSITY.

BY S. M. S.

**T**HREE are some Hardware dealers whose stores are all they should be, and some whose stores are not, but might be more profitable. To draw customers and to hold them the Hardware store must have strong attractions. It should draw people with money to spend and a willingness to spend it. It should be attractive in the widest sense; not pretty to look at merely.

To my mind Ranges, Sewing Machines and Bicycles would attract new trade, and yet not detract from the main interest. The up to date Hardwareman, who makes it a point to select some good household specialty, or some article for which there is a demand as a profitable side line, is building up for himself a business that will increase and prove more lucrative each succeeding year.

## Well Worth While.

The Hardware merchant who starts out to establish himself on specialty lines will find it worth all the energy which he may expend on them. However, in order to get the best and most profitable results it is necessary that he thoroughly master the various specialty lines he takes up, so as to be able to talk and present them to his trade in the right spirit and manner. By taking up some good specialty which he can control in his section he gets a larger profit than can be had from a purely competitive line. In fact, his profit must be sufficient to enable him to study the line, and take such other steps as are necessary to make himself thoroughly acquainted with all of the good points and various uses of the specialty lines he handles.

## Steel Ranges.

Steel Ranges are a splendid specialty line. They are in constant demand, and a Steel Range to-day is nothing more nor less than an up to date, modern family Cook Stove. In selling Ranges the first act is to get the customer's confidence and get his mind in a receptive mood. Endeavor to find out the distinctive Range features your prospect is seeking, and then point out and show that your Range possesses all these features, together with a great many more. Find out whom your Range competitors are, and the make of Range or Ranges in the field against you.

Avoid arguments with your customers; avoid mentioning the names of any other Ranges or competitors. Always talk your own Range, keeping in mind, of course, the other fellow and the strong and weak points of his Range, always with the end in view to make your own points stronger. If you know the strong points that your competitor makes on his Range dwell on these points, and show the competitive features of your Range to be more desirable. Study your Range, and be able to make strong defense of the weak points as against the strong points on your competitor's Range. Possibly your Range may not embrace all of the desirable points, therefore you must be able to advance a strong argument on your good points, and in that way more than offset some desirable features that your competitor's Range may have. Above all, avoid getting so deep in theory, cause and effect that your prospective customer cannot follow you.

## Sewing Machines.

More Sewing Machines are being sold to-day than ever before. This is a line that is rapidly drifting almost entirely into Hardware channels, and the number of Sewing Machines that can be sold annually by the Hardware dealer who takes an interest in the line is limited only by his ability to handle the proposition and his persistence in pushing it.

In presenting your Sewing Machine to your customers dwell strongly on the simplicity of your Machine and the ease with which all lost motion can be taken up after several years of wear. If your Machine is of the drop head pattern call special attention to the dustproof case, as well as the convenience of the automatic lift, if it happens to be so constructed. Quality and durability in a Sewing Machine count for as much as speed or ease of operation. Always advise your customers to read over carefully the instruction book which accompanies

each Sewing Machine, and in that way endeavor to get familiar with the working parts, as well as the various uses of the attachments. The surest way to clinch a Sewing Machine sale is to say to your prospective customer, "Take it home, and if after using it three or four times you find that it is not as I represent it, or it does not do the work satisfactorily, bring it back, and we will give you your money back." You know that if it was not satisfactory it would come back anyhow, and if you handle a good brand of Sewing Machine you are entirely safe in making this proposition.

## Bicycles.

Bicycles are again coming into almost universal demand. More new Bicycles were bought and ridden during 1906 than during any period since 1900, and in the opinion of the factory experts 1907 is going to be the banner year since the boom period.

Bicycles are very much alike, yet there are many individual features which can be pointed out, such, for instance, as the one or two piece cranks, the flush head fittings, the detachable sprockets, the coneless pedals and the essential difference that your Wheel is perhaps better finished than the mount your competitor is handling.

Don't expect to make 100 per cent. profit on every Wheel you sell; yet many of the articles classed as Bicycle Sundries will pay a great deal more, besides an attractive display of sundries will bring men and, therefore, more prospective customers into your store.

## Push Side Lines with Energy.

In advocating easy selling specialty lines I take it for granted that the Hardware dealer realizes that the day has gone by when people will buy things in one line at one store and in another line at another store, taking without question what the one line merchant says they, the people, ought to want. The up to date Hardwareman will continue to sell Hardware, of course, but quit pushing staples on the score of price alone. Back up your staples, but put most push on side lines that will give you a reputation for having the right quality at a fair price, and still enable you to make a good profit on them. Then, while your competitors are cutting prices on Fence Wire and Nails, push to the front such specialties as are in every day use.

THE Studebaker Bros. Mfg. Company, South Bend, Ind., is distributing from its exhibit at the Jamestown Exposition a beautifully printed folder, the opening pages of which are devoted to a description of historic Jamestown, with views of various points of interest. On other pages are given maps showing that part of Virginia in the immediate vicinity of Jamestown, and a complete plan of the Exposition grounds. The balance of the folder is devoted to a short description of the various vehicles built by the company, with a short history of two famous carriages, the Lafayette and the Lincoln, both of which are the property of the company, and are included in its exhibit.

VISITORS to the Jamestown Exposition are having their attention effectively called to the Saws of E. C. Atkins & Co., Indianapolis, Ind., by an open air exhibit. Large kites are used from which mammoth banners are suspended, together with figures of a man and woman swinging on trapezes. The banners are 30 by 40 ft. in dimensions and floating an eighth or a quarter of a mile in the air with the figures between them, attract a good deal of notice.

THE CLEVELAND TWIST DRILL COMPANY, Cleveland, Ohio, and 62 Reade St., New York, has just issued, for gratuitous distribution, a very useful trade help in the form of a "Handy Price List" of Drills, Reamers, Sockets and Arbors of its production. The lists are in tabular form, sizes in red and prices in black ink, printed on paper, both sides, strengthened with cloth between, eyeleted and brass-bound top and bottom, size 13 $\frac{3}{4}$  x 8 $\frac{3}{4}$  in. to hang.

## Hardware Window Display

Nineteenth Article.

### FURTHER OBSERVATIONS ON CARD SIGNS.

In a former article of this series some attention was devoted to the subject of lettered signs for the show window and a number of examples furnished by a well-known retailer were given to illustrate put and effective cards. Herewith are presented several other specimens of good sign composition, which are interesting both in this connection and also because of the suggestions which they afford as to methods of featuring specialties, pushing seasonable goods and clearing out stock.

Fig. 1 shows an artistic and pointed card prepared to accompany an Enamored Ware display; Figs. 2 and 3 direct attention to goods in season. The former goes

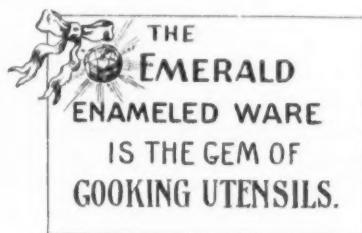


Fig. 1.—Appropriate Design and Wording.

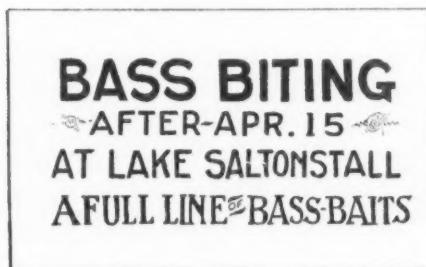


Fig. 2.—Of Interest to Fishermen.

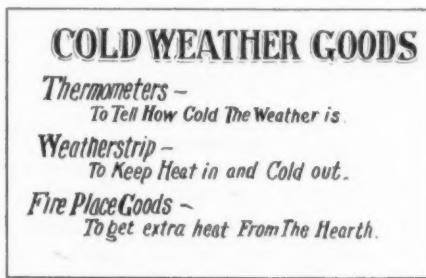


Fig. 3.—Bright and Cold.

with a Fishing Tackle window; the latter, which is especially clever, both in wording and arrangement, calls attention to fall and winter lines. In Fig. 4 is reproduced a sign to accompany a display of left over holiday specialties.

#### Post-Inventory Sale.

Figs. 5 and 6 present signs used in connection with the annual sale of odds and ends which the John E. Bassett & Co., New Haven, Conn., holds each season after inventory has disclosed what stock it is desirable to get rid of in this way. The sale is announced by the larger sign of the two, which describes in a general way the nature of the bargains offered. In preparing the sale goods are divided into lots, which can be closed out at the same prices, these lots being arranged in groups in the window accompanied by a smaller sign, like Fig. 6, advertising the price of the articles in the group. It is

the experience of the firm that there is almost nothing which it has occasion to offer by this method which somebody will not have a use for and snap up at the tempting price.

THE SCHMID & LEHRER COMPANY, Springfield, Minn., lately issued a four-page circular of poster dimensions in which attention was effectively called to a number of items from the company's extensive stock, such as Stoves, Farming Implements, Sporting Goods, Household Specialties, &c. The circular was profusely illustrated, prices being given in nearly all cases, and proved to be a trade winner.

THE July number of the house bulletin issued in the interest of Smith's General Hardware Store, Shrewsbury, Pa., was devoted to "Hot July Specials from Different

CHRISTMAS LEFT-OVERS  
at interesting prices  
THIS WEEK ONLY.

Fig. 4.—An Opportunity for Bargain Hunters.

ANNUAL SALE  
of ODDS <sup>and</sup> ENDS  
Shop worn goods we found  
during Inventory  
You can buy them at less -  
much less - than we bought them.  
DO IT NOW  
We may not have them to-morrow.

Fig. 5.—Announcement of Post-Inventory Sale.

ANNUAL SALE  
of ODDS <sup>and</sup> ENDS  
any article in this section  
8 cents

Fig. 6.—Price Card for Group in Post-Inventory Sale.

Departments." These covered Shovels, Forks, Squares, Padlocks, Oil Cans, Water Coolers, Cradles and Snaths, Clothes Lines and Pins, Kitchen Ware, Hammocks, Croquet Sets, &c., on nearly all of which special prices were named.

C. B. BUTLER, who for 16 years was engaged in the Hardware business at Homer, Ill., died July 15 at his home in that place. Mr. Butler had but recently returned from a Chicago hospital, where he had undergone a serious surgical operation, which failed to stay the progress of the malady from which he suffered. He was a member of the Homer Masonic and Odd Fellows' lodges and the order of the Modern Woodmen, and was also a member of the Methodist Church, of which he was a most liberal supporter. He is survived by a widow and two daughters.

## Business Methods in a Builders' Hardware Store.

THREE years ago Robert A. Reynolds & Son started a business at 270 Main street, Stamford, Conn., with a stock composed principally of Builders' Fine Hardware. The venture has prospered beyond expectations. Ninety per cent. of the business is done with building contractors and owners of buildings. The class of buildings

factory methods. The system introduced in the store three years ago has been adapted to the growing needs of the business and has proved adequate to all re-

In Case of Error or Exchange of Goods Return this Bill.		
Robert A. Reynolds & Son, BUILDERS' HARDWARE Telephone 251-4.		
12/12 1906		
Stamford, Conn.		
to Thomas Bland		
Address		
Sold by R. Am't Rec'd.		
3	N 333 Lyddon Sets	2.10
3	1/2 24102 Sets 4x4	7.50
1	" " 5x5	.30
1	SB 1842 Lyddon Set	3.10
18	839 Sash Fast	1.08
		7.33
Chg 1		

Fig. 1.—Charge Sales Ticket.

catered to is residential rather than structures intended for business purposes, although churches, banks, public and office buildings, &c., are also looked after. The firm's contracts run from \$50 to \$3000, and an average of about \$15,000 to \$20,000 worth of contracts are usually under way. Filling contracts is not confined to Stamford and vicinity, but also cover a large adjacent territory, which is visited by two salesmen. Mr. Reynolds, Sr., was in

In Case of Error or Exchange of Goods Return this Bill.		
Robert A. Reynolds & Son, BUILDERS' HARDWARE Telephone 251-4.		
12/12 1906		
Stamford, Conn.		
to Cash		
Address		
Sold by R. Am't Rec'd. 5.00		
1	11/2 Hammer	.70
1	28 Saw 26.8	1.90
1	" " .5	1.90
1	65 Screw Driver 7.	.40
		4.90
2		

Fig. 2.—Cash Sales Ticket.

charge of the Hardware department of Yale & Towne Mfg. Company's factory for 15 years previous to opening this store, and was particularly well fitted to thoroughly systematize his business through his familiarity with

Please preserve this slip as this order with others will constitute your itemized account.

### NOTICE.

In event of error in filling your order or any dissatisfaction as to goods or delivery, kindly hand this slip to OUR SALESMAN to assist in rectification.

If you do { GOOD GOODS  
not get { IN GOOD ORDER  
PROMPTLY

Let Us Know at Once.

We Appreciate Your Patronage and are Anxious to Serve you Well.

Robert A. Reynolds & Son,  
Telephone 251-4. 270 Main St.  
STAMFORD, CONN.  
BILL ON OTHER SIDE.

Fig. 3.—Back of Sales Ticket.

quirements. It has been thoroughly tested, and has proved its efficiency.

### Sales Tickets.

As the sales are made the basis of keeping track of stock, this part of the system will be taken up first. The sales tickets are bound in stiff covers, one book for each salesman. In Figs. 1 and 2 is shown the difference

Salesman	R	Dept	Date	12/12
CASH SALES	Charge Sales	CASH SALES	Charge Sales	
1	7.33			26
2				27
3				28
4				29
5				30
6				31
7				32
8				33
9				34
				35
20				
21				
22				
23				
24				
25				

Fig. 4.—Record of Daily Sales.

in the manner of making out tickets for cash and charge sales, Fig. 1 being marked "chg." while Fig. 2 is made out to "cash," having the amount of cash received marked on it to aid in correcting errors, if any happen, in giving change. The salesman's initial is also written on each ticket. Tickets for each sale are made in duplicate, one going on file in the store and the other being wrapped up in the customer's package.

On the back of the customer's ticket is printed the notice reproduced in Fig. 3. Each pair of tickets has the same number, and the amount of each sale is entered by the salesman on a printed blank form, Fig. 4, in the back of the sales book, under cash or charge sales, as

the case may be, on the line corresponding with the ticket number. In this way a record of daily sales is obtained. One of these blank forms is used by each salesman and for one day only.

At the end of the day the tickets go to the cashier, and the cash sale tickets are used as an aid in correctly making up the cash sales for the day. When making out statements on the first of each month for running accounts the total of each sales ticket, in addition to balance due, if any, is entered on the statement, and not the items of each sale, which saves much labor.

(To be continued.)

### PRICE-LISTS, CIRCULARS, ETC.

*Manufacturers in Hardware and related lines are requested to send us copies of catalogues, price-lists, &c., for our Catalogue Department in New York; and at the same time to call attention to any new goods or additions to their lines, of which appropriate mention will be made, besides the brief reference to the catalogue or price-list in this column.*

NATIONAL SCREW & TACK COMPANY, Cleveland, Ohio: Catalogue devoted to Wood and Machine Screws, Nuts, Stove and Chair Rods, Bolts, Coach Screws, Rivets, Cutters and Keys, &c.

HUMASON & BECKLEY MFG. COMPANY, New Britain, Conn.: Catalogue devoted to Hammers, Bright Wire Goods, Wrought Goods, Cotton Hooks, Pocket Cutlery, &c.

L. CLINE MFG. COMPANY, Chicago, Ill.: Illustrated catalogues relating to Shower Bath Yokes, Bathroom Specialties, Roasting and Baking Pans, Enamels, Polishes, Window Cleaners, Candelabra, Andirons, Hot Plates, Gas Heaters, Trays, Match Holders, &c.

EAGLE MFG. COMPANY, Kansas City, Mo.: Catalogue of Stalk Cutters, Listers, Cultivators, Plows, Harrows, Corn and Cotton Planters, Double Shovels, Kaffir Corn Headers, Seeders, Horse Rakes, Hay Presses, &c. Repair list No. 32 accompanies the catalogue.

WILLIAM K. ALDRICH COMPANY, Lowell, Mass.: Catalogue relating to Hand Screws, Clamps, Mill Baskets, Drill Attachments, Quick Action Vises, &c.

JARECKI MFG. COMPANY, Erie, Pa.: Catalogue illustrating Malleable and Cast Iron, Gas, Steam and Water Fittings, Brass and Iron Valves and Cocks, Steam and Hot Water Radiators, Pipe Threading Tools, Steam Engine and Air Compressor Governors, Oil, Artesian and Natural Gas Well Supplies, &c.

WM. D. GIBSON COMPANY, Huron and Kingsbury streets, Chicago, Ill.: Catalogue devoted to Spiral and Flat Springs made of high grade crucible cast steel for all kinds of machinery, Upholsterers' Springs, Bent Wire Articles, Staples, Double Pointed Tacks, &c.

J. WISS & SONS COMPANY, Newark, N. J.: Catalogue illustrating Tailors' Shears, Bent and Straight Trimmers, Barbers' Shears, Scissors, Paper and Bankers' Shears, Candy and Glass Shears, Pruning and Tinnings' Shears, Razors, Razor Strrops, &c.

SPEARS & RIDDLE COMPANY, Wheeling, W. Va.: Illustrated booklet devoted to the Ideal Power Washing Machine, which is operated by water motor propelled by city water pressure.

H. S. GEER COMPANY, Troy, N. Y.: Illustrated circular showing Cone and Cup Ice Cream Dippers, Ice Cream Scrapers and Burlap Binders.

STANDARD SEWING MACHINE COMPANY, Cleveland, Ohio: Catalogue devoted to Rotary Shuttle Sewing Machines. The company also makes Vibrating Shuttle Sewing Machines.

The Russell-Porter Hardware Company, West Allis, Wis., is erecting a new two-story building, which is to be completed this fall. The ground floor will contain three stores, one of which will be occupied by the post office.

### MISCELLANEOUS NOTES.

#### Arrow Ash Can.

The Arrow Can Company, 35 Warren street, New York, has just added to its line of reinforced galvanized cans for ashes, garbage, waste and other uses a No. 3, 19 x 24 in. ash can, "Arrow" brand and strictly high grade, the preceding sizes being No. 01, 15 x 18 in.; No. 1, 15 x 24 in., and No. 2, 17 x 24 in. These cans are comparatively new in the trade, with body in one piece of heavy gauge steel, having flutes inside of which are  $\frac{1}{2}$ -in. steel rods run through holes in heavy solid top and solid bottom and riveted, making it practically impossible to pull the bottom and top apart. The can is made in the black, and heavily galvanized after assembling, making the parts stronger and watertight. The cans are furnished with or without heavy covers, having a beaded edge and handle. This line of cans is especially recommended for use in hotels, apartment houses and office buildings, where the service is severe.

#### Sulpho-Naphthol Disinfectant.

Sulpho-Naphthol Company, Boston, Mass., and 125 East Twenty-third street, New York, in charge of W. L. Fitch, is the manufacturer of Sulpho-Naphthol, a liquid germicide and insecticide. It is recommended by the company for the house, hotel, school and all public and private buildings and institutions. It is offered as strictly non-poisonous and non-corrosive and as harmless as water to human beings. One tablespoonful in a pail of warm water can be used instead of soap for cleaning floors, wood marble, tiling, &c. Also for cleansing carpets, kitchen sinks, cellars, closets, urinals, one or two tablespoonfuls can be used in a pail of water according to the directions given. Used in a sprayer it is applied to places infested with roaches, ants, bedbugs and, the pure material placed in small earthen dishes, in the usual paths of rats or mice, will rid houses of them, it is said.

#### Squat Pattern Marion Harland Coffee Pots.

Silver & Co., 304 Hewes street, Brooklyn, N. Y., and 97 Chambers street, New York, are now manufacturing the Marion Harland Coffee Pot in full burnished copper, tinned inside, in what the trade will recognize as "squat" pattern; *i. e.*, broad in proportion to height, with parallel sides. It is also made in copper, polished and nickelized, the sizes being 1, 2 and 3 quarts.

#### Agatite.

James S. Longhurst, Jr., Lynbrook, L. I., N. Y., is now putting up Agatite, for mending holes in enameled ware, in a round turned wood box 1 5-16 in. in diameter, that retails for 15 cents. This mending material is also sold in larger sizes at 25 and 50 cents each. A catch phrase the manufacturer uses is that "Agatite makes Agate tight," mending all kinds of enameled wares, tin, sheet iron, glass, crockery, &c., but designed primarily for repairing instantly at slight cost housefurnishing and cooking utensils. The substance is a black paste, a little of which is pressed through and around both sides of a hole, then heated and lastly covered with cold water, when the repair is made, later heatings improving rather than deteriorating the repair. It is absolutely harmless, we are informed, and made in black only. Early in the coming Fall the maker expects to have on the market the same material in stick form for use on steam, water and gas pipe, which when applied will withstand 40 lbs. pressure.

#### Galvanized Wire Clothes Lines.

The Malin & Co., Cleveland, Ohio, manufacturer of Spool Wire, Wire Belt Lacing, &c., is now making a full assortment of galvanized wire Clothes Lines, including hollow twisted, Nos. 1, 2, 3 and 4; solid twisted, Nos. 11, 18, 19 and 20, and regular solid Lines, Nos. 8, 9 and 10. These are all put out under the brand "Triple Plate." The company urges in favor of its Lines that they are soft, so that they may be easily stretched from post to post; smooth, so that they may be kept clean and will not tear or roughen fabrics hung on them; and

heavily galvanized to keep them from rusting and dis-coloring clothes. The Lines come neatly coiled.

#### Noack Ball Bearing Pin Tumbler Cylinder.

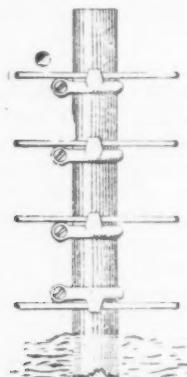
Branford Mfg. Company, Branford, Conn., is furnishing in all its Cylinder Locks and Latches the Noack Ball-Bearing Pin Tumbler Cylinder. It is urged in favor of this device that it not only works and wears well, but it cannot be picked. A German silver ball is inserted in a recess at the lower end of each pin in the lock. Consequently it is impossible to make the pin stay where placed in picking. The balls being at the end of the pins also reduce friction and insure long life for both lock and key.

#### Barney & Berry Roller Skates.

Barney & Berry, Springfield, Mass., have greatly improved the action of their roller skates by the substitution of a new hanger on the under portion of the body, the effect of which is greater flexibility and the making of short turns with a free, easy motion. The embossed frame has been greatly strengthened and an entirely new style of roller bearing introduced, with improved sheet steel ball retainer and cones and grooved ball race which permits of a new and positive form of adjustment of the cones, which requires no skill to determine. Steel balls  $\frac{1}{4}$  in. diameter are used instead of the customary 3-16 in. size, insuring, it is said, about three times the strength and durability. The cones are of carbonized steel and as the balls, five to each bearing, are held in retainers, there is no scattering of them if a wheel runs off or need of constant adjusting by inexpert users.

#### The M-K Fence Post.

The fence post illustrated herewith is manufactured by the M-K Fence Company, St. Joseph, Mo. The post is made of wrought iron pipe or tubing and is ordinarily from 1 $\frac{1}{4}$  to 2 in. in diameter. Its principal feature is the device used to fasten the wire to it. This consists of a malleable iron clamp ring, similar to the common form of rubber hose bands, having a lug on one side for the purpose of catching and holding the wire. The method of its application is plainly shown in the



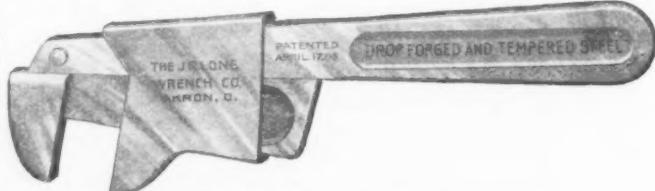
The M-K Fence Post.

illustration, and it is claimed that either straight or woven fence wire fastened with these clamps will not slip or loosen. It will be observed that with this form of fastening it is unnecessary to drill holes through the posts, the clamp being secured by the tightening of the holding bolt. It is represented that in the use of this device every post maintains the strain of its own wire in a longitudinal direction, thus relieving the corner or end posts of undue tension.

#### The New Departure Wrench.

The Wrench shown in the accompanying engraving is the product of the J. R. Long Wrench Company, Akron, Ohio, which was organized to manufacture it. Although

embodying an idea which is declared to be new and valuable, as applied to Wrench construction, the tool is exceedingly simple, consisting of only three pieces, the front jaw, the yoke and the handle bar. The jaw and handle bar are made of drop forged steel, while the yoke is made of cast steel in one piece. The feature of the Wrench to which attention is especially called is that it is self-locking. It has no screw or springs, but by the free action of the front jaw and handle bar

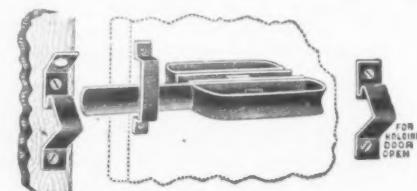


The New Departure Wrench.

moving forward or backward a leverage is secured which is said to make adjustment instantaneous and the grip so sure that there is no danger of slipping, as the Wrench can only be taken from the object on which it is applied by releasing the hold on the lever. The Wrench is now being made in sizes from 4 to 10 inches only, but when the company's factory is fully completed and equipped it is intended to make sizes up to 18 in.

#### The Jewel Latch.

The Peck-Hamre Mfg. Company, Berlin, Wis., is offering the door latch shown in the accompanying illustration. It is made entirely of steel, without springs in its construction. The screws cannot be removed when the

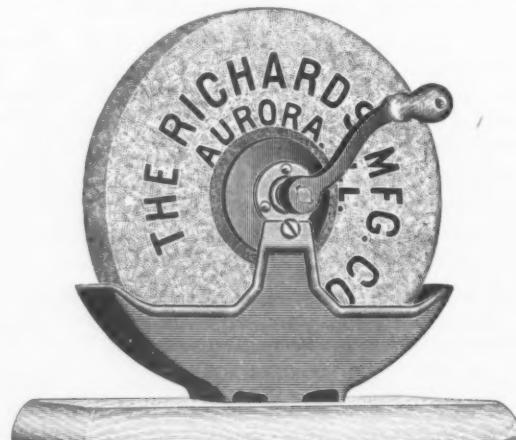


The Jewel Latch.

latch is locked and the latch is suitable for any thickness of door. The device is warranted to catch every time, no matter how hard or how lightly the door is closed. It has handles on both sides and holds a door both open and shut. The latch is designed to retail for 25 cents.

#### Richards Ball Bearing Kitchen Grindstone No. 320.

The accompanying illustration represents ball bearing kitchen grindstones, offered by the Richards Mfg.



Richards Ball Bearing Kitchen Grindstone No. 320.

Company, Aurora, Ill. The stones are described as superior in quality and accurately mounted on ball bearing journals. The line includes 7 to 12 in. stones, making six sizes.

## Kiel's E-Z Washer.

The Kiel Mfg. Company, Omaha, Neb., is offering the washer illustrated herewith. It is made of hard maple with frame drawn together by bolts and cross rods, which can be tightened up from time to time, making it firm and durable under the hardest usage. A galvanized iron tub fits in the frame. The machine weighs 30 lb., but is mounted on rollers, so that it can be easily rolled about the house. It has an expansion coil spring in the lever with foot treadle attachment, which affords increased power with a saving of energy. There are no cogs or wheels. Any



Kiel's E-Z Washer.

family wringer may be attached and may remain ready for instant use during the entire washing and rinsing. The washer operates on a principle which is said to be new as applied to machines of this kind utilizing air pressure, which forces water directly through the clothes by suction instead of pulling and lifting the clothes or rubbing them on the hard rough surface of a washboard or on pegs, slats or corrugations. In further explaining the operation of the machine the makers state that there is a hollow, pan shaped metallic dasher, to which is attached a ratchet handle fastened to a lever that works automatically, revolving the dasher at every stroke of the machine. By simply lifting the dasher air is forced into it at the top of the water, when, by pressing it down through the clothes and water with the lever, the air is expanded and a suction is caused, which makes a very high pressure of water without friction.

## PAINTS, OILS AND COLORS

Animal, Fish and Vegetable Oils— $\frac{p}{b}$  gal

Linseed, City, raw.....	43 @44
City, Boiled.....	44 @45
State and Western, raw.....	39 @40
Raw, Calcutta, in bbls.....	70 @4
Lard, Extra Prime, Winter.....	75 @77
Extra No. 1.....	53 @55
No. 1.....	49 @52
Cotton-seed, Crude, f.o.b. mills.....	@4
Summer Yellow, Prime.....	@56
Summer White.....	@58
Yellow Winter.....	@59
Sperm, Crude.....	59 @60
Natural Winter.....	72 @73
Bleached Winter.....	75 @76
Bleached Winter, Extra.....	@4
Tallow, Prime.....	60 @61
Whale, Crude.....	35 @36
Natural Winter.....	48 @49
Bleached Winter.....	50 @51
Extra Bleached Winter.....	52 @53
Menhaden, Brown, Strained.....	32 @33
Light Strained.....	32 @33
Northern.....	@4
Southern.....	@4
Cocoanut, Ceylon.....	39 lb 9 $\frac{1}{2}$ oz @9%
Cochin.....	39 lb 10 @10%
Cod, Domestic, Prime.....	36 @38
Newfoundland.....	40 @42
Red, Elaine.....	47 @50
Saponified.....	39 lb 7 @7 1/4
Olive, Italian, bbls, Yellow.....	65 @70
Neatsfoot, Prime.....	56 @57
Palm, Logos.....	39 lb 7 @7 1/4

## Mineral Oils—

Black, 20 gravity, 25@30 cold test.....	12 $\frac{1}{2}$ @13
20 gravity, 15 cold test.....	13 @13 1/2
Summer.....	12 @12 1/2
Cylinder, light filtered.....	16 1/2@17 1/2
Dark, filtered.....	16 1/2@17 1/2
Paraffine, 903-907 gravity.....	14 @14 1/2
903 gravity.....	13 @13 1/2
883 gravity.....	10% @11 1/2
Red.....	13 @14

## Miscellaneous—

Barytes.....	
White, Foreign.....	39 ton \$18.50@20.50
Amer, floated.....	39 ton 19.00@20.00
Off color.....	39 ton 13.00@16.50
Chalk, in bulk.....	39 ton 3.00@ 3.25
In bbls.....	39 ton ... @33
China, Clay, Imported.....	39 ton 11.00@17.00
Cobalt, Oxide.....	39 ton 2.50@ 2.60
Whiting, Commercial.....	39 ton 100 lb .43@ .52
Gilders.....	39 ton 100 lb .55@ .65
Ex. Gilders.....	39 ton 100 lb .60@ .65

Putty, Commercial— $\frac{p}{b}$  ton

In bladders.....	1.70 @1.85
In bbls, or tubs.....	1.20 @1.45
In 1 lb. to 5 lb. cans.....	2.65 @2.95
In 12 1/2 to 50 lb. cans.....	1.50 @1.90

Spirits Turpentine— $\frac{p}{b}$  gal.

In Oil bbls.....	59@60
In machine bbls.....	60 @60

## Glue—

Cabinet.....	12 @15
Common Bone.....	7 $\frac{1}{2}$ @9
Extra White.....	7 $\frac{1}{2}$ @24
Foot Stock, White.....	12 @14
Foot Stock, Brown.....	9 @11
French.....	10 @10
Irish.....	13 @16
Low Grade.....	10 @12
Medium White.....	14 @17

Gum Shellac— $\frac{p}{b}$  lb

Bleached, Commercial.....	44 @45
Bone Dry.....	53 @54
Button.....	40 @50
Diamond I.....	58 @59
Fine Orange.....	52 @57
A. C. Garnet.....	45 @46
G. A. L.....	42 @43
Kala Button.....	33 @36
D. C.....	62 @63
Octagon B.....	56 @57
T. N.....	43 @45
V. S. O.....	58 @59

Colors in Oil— $\frac{p}{b}$  lb

Black, Lampblack.....	12 @14
Black, Chinese.....	36 @46

## Dallett Automatic Hose Couplings.

The Thomas H. Dallett Company, York street and Sedgley avenue, Philadelphia, Pa., is offering the automatic hose coupling illustrated herewith. The gasket used is of rubber composition, which will not be affected by oil or gasoline, and is held in the socket half of the coupling by the flange around the larger end fitting into a recess. The gasket does not fall out when the coupling is disconnected and when a new gasket is necessary it can be inserted in a few seconds. When the coupling is connected the tapering end of the gasket enters into the conical opening in the spigot part and is a loose fit therein. When pressure comes on the coupling the tapered end of the gasket is expanded against the wall of the conical opening to make a perfect joint, which the greatest pres-



Dallett Automatic Hose Couplings.

sure makes tighter, and as soon as the pressure is relieved the gasket is again loose, so that no matter how long a coupling may remain connected it will not adhere to the metal and be torn and ruined when the coupling is taken apart. The spigot part of the coupling is provided with four locking lugs, and when the spigot and socket parts are snapped together the lugs insure their being held squarely, which obviates the tendency to leak. The coupling is connected by pressing the parts together and giving one-eighth of a turn, when the locking ring springs into place. To disconnect, the locking ring is pressed back and one-eighth turn given. The entire coupling is made of hard bronze composition, has no small parts to give trouble and no projecting pieces to catch when the hose is trailed along the ground. Couplings are made for various sized hose.

CHARLES A. SCHIEREN & Co., corner Cliff and Ferry streets, New York, tanners and manufacturers of Leather Belting, &c., have begun the publication of a house organ entitled "The Belt Book," a magazine intended for users of belting. The initial number is dated the current month and subsequent issues will appear quarterly or possibly monthly, as may be decided later. The magazine is freely illustrated and contains technical and trade information which will doubtless be of value to customers of the company.

White Lead, Zinc, &c.— $\frac{p}{b}$  lb

Lead, English white, in Oil.....	10% @10%
Lead, American White:	
Lots of 500 lb or over, in Oil.....	@ 7%
Lots less than 500 lb, in Oil.....	@ 8
Lead, White, in oil, 25 lb tin pails, add to keg price.....	@ 1/2
Lead, White, in oil, 12 $\frac{1}{2}$ lb tin pails, add to keg price.....	@ 1
Lead, White, in oil, 1 to 5 lb ass'ted tins, add to keg price.....	@ 1/4
Lead, American, Terms: For lots 12 tons and over $\frac{1}{4}$ c. rebates; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 2% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.	
Zinc, American, dry.....	5% @ 5%
Zinc, French.....	11% @ 12%
German.....	12% @ 9
American.....	13% @ 9
Red, Indian, English.....	4% @ 6
American.....	3 @ 3 1/2
Red, Turkey, English.....	4 @ 10
Red, Tuscan, English.....	7 @ 10
Red, Venetian, Amer.....	100 lb \$0.50@1.25
English.....	100 lb \$1.50@1.60
Sienna, Italian, Burnt and Powdered.....	
Italian, Raw, Powdered.....	3 @ 9
American, Raw.....	3 @ 7
American, Burnt and Pow'd.....	14% @ 2
Talc, French.....	39 ton \$18.00@25.00
American.....	39 ton 15.00@25.00
Terra Alba, French.....	100 lb .90@ 1.00
English.....	100 lb .80@ 1.00
American.....	100 lb, No. 1, .75@ .80
American.....	100 lb, No. 2, .60@ .65
Umber, T'key, Bnt, & Pow.....	12% @ 3%
Burnt, American.....	15% @ 2
Raw, American.....	12% @ 2
Yellow Chrome, Pure.....	12 @ 14
Vermilion, American Lead.....	7 @ 25
Quicksilver, bals.....	65 @ .
Quicksilver, bags.....	66 @ .
English, Imported.....	65 @ 70
Chinese.....	30.90@31.00

# Current Hardware Prices.

**General Goods.**—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

**Special Goods.**—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

**Range of Prices.**—A range of prices is indicated by means of the symbol @. Thus 33 1/2 @ 33 1/2 & 10% signifies

that the price of the goods in question ranges from 33 1/2 per cent. discount to 33 1/2 and 10 per cent. discount.

**Names of Manufacturers.**—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1907, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

**Standard Lists.**—“The Iron Age Standard Hardware Lists” contains the list prices of many leading goods.

**Additions and Corrections.**—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

## Adjusters, Blind—

Columbian and Domestic.....33 1/2%  
North & South.....10%  
Zimmerman's—See Fasteners, Blind.

## Window Stop—

Ives' Patent.....35%  
Tappin's Perfection.....35%

## Ammunition—See Caps, Cartridges, Shells, &c.

## Anti-Rattlers—

Fernald Mfg. Co., Burton Anti-Rattlers,  $\frac{1}{2}$  doz. pairs, Nos. 1, \$0.75; 2, \$0.60; 4, \$1.00; 5, \$0.50.  
Fernald Quick Shifter,  $\frac{1}{2}$  doz. pairs, \$2.00 @ \$3.00

## Anvils—American—

Eagle Anvils..... $\frac{1}{2}$  lb. @ \$14  
Hay-Budden, Wrought.....9 1/2 @ 9 1/2%  
Trenton..... $\frac{1}{2}$  lb. 9 1/2 @ 9 1/2%

## Imported—

Peter Wright & Sons,  $\frac{1}{2}$  lb. \$4 to 349  
lb. 11¢ to 600 lb. 11 1/2¢.

## Anvils, Vise and Drill—

Millers Falls Co. \$18.00.....15 & 10%

## Apple Parers—See Parers, Apple, &c.

## Aprons, Blacksmiths'—

Livingston Nail Co. ....33 1/2%

## Augers and Bits—

Com. Double Spur.....70 & 10 @ 75%  
Jennings' Patn., reg. finish.....60 & 10 @ 60 & 10%

Black Lip or Blued.....65 @ 65 & 5%

Boring Mach. Augers.....70%

Car Bits, 12-in. twist.....40 & 10%

Ford's Auger and Car Bits.....40 & 5%

Ft. Washington Auger Co., Conard's.....35%

Forster Pat. Auger Bits.....25%

C. E. Jennings & Co.:

No. 10 ext. lip, R. Jennings' list, 25 & 7 1/2%

No. 30, R. Jennings' list, 50%

Russell Jennings' list, 25 & 10 & 2 1/2%

L'Hommedieu Car Bits.....15%

Mayhew's Countersink Bits.....45%

Pugh's Black.....20%

Pugh's Jennings' Pattern.....35%

Snell's Auger Bits.....60%

Snell's Bell Hangers' Bits.....60%

Snell's Car Bits, 12-in. twist.....60%

Snell's King Auger Bits.....50%

Wright's Jennings' Bits.....50%

## Bit Stock Drills—

See Drills, Twist.

## Expansive Bits—

Clark's Pattern, No. 1,  $\frac{1}{2}$  doz. \$26;

No. 2, \$18.....60 & 10%

Ford's, Clark's Pattern.....65 & 5%

C. E. Jennings & Co., Steer's Pat. 25%

Lavigne Pat., small size, \$18.00; large size, \$36.00.....60 & 10%

Swan's \$26.00.....60%

## Gimlet Bits—

Per gro.

Common Dble. Cut.....\$3.00 @ \$3.25

German Pattern, Nos. 1 to 10, \$4.75; 11 to 13, \$5.75

## Hollow Augers—

Bonney Pat., per doz. \$6.50 @ 7.00

Ames.....25 & 10%

Universal.....20%

## Ship Augers and Bits—

Ship Augers.....40 & 10%

Ford's.....33 1/2 @ 35%

C. E. Jennings & Co.:

L'Hommedieu's.....6%

Watrous'.....33 1/2 @ 37 1/2%

Snell's.....40%

## Awl Hafts—See Handles, Mechanics' Tool.

## Awls—

Brad Awls:

Handled.....gro. \$2.75 @ 3.00

Unhandled, Shilded.....gro. \$3 @ 3.50

Unhandled, Patent.....gro. \$6 @ 7.00

Peg Awls:

Unhandled, Patent, gro. \$1 @ 3.50

Unhandled, Shilded.....gro. \$6 @ 7.00

Scratch Awls:

Handled, Com. gro. \$3.50 @ 4.00

Handled, Socket.....gro. \$11.50 @ 12.00

## Awl and Tool Sets—See Sets, Awl and Tool.

## Axes—

Single Bit, base weights: Per doz.

First Quality.....\$4.75 @ 5.00

Second Quality.....\$2.25 @ 3.50

## Double Bit, base weights:

First Quality.....\$7.00 @ 7.50

Second Quality.....\$6.50 @ 6.75

## Axle Grease—

See Grease, Axle

## Axes—

Iron or Steel

Concord, Loose Collar.....4 1/2 @ 5¢

Concord, Solid Collar.....4 1/2 @ 6.5¢

No. 1 Common, Loose.....3 1/2 @ 3 1/2¢

No. 1 1/2 Com., New Style.....4 1/2 @ 5¢

No. 2 Solid Collar.....4 1/2 @ 6¢

1/2-lb. Patent.....

Nos. 7, 8, 11 and 12.....60 & 65¢

Nos. 13 to 14.....60 & 65¢

Nos. 15 to 18.....65 & 70¢

Nos. 19 to 22.....65 & 70¢

## Boxes, Axle—

Common and Concord, not turned

lb., 4 1/2 @ 6¢

Common and Concord, turned

lb., 5 1/2 @ 6¢

Half Patent.....lb., 9 1/2 @ 10¢

## Bait—

Fishing—

Hendry:

A Bait.....20%

B Bait.....20%

Competitor Bait.....20 & 5%

## Balances—

Sash—

Caldwell new list.....50%

Pullman.....50 & 10 @ 60%

## Spring—

Spring Balances.....50 & 10 @ 60%

Chatillon's:

Light Spg. Balances.....50 & 50 @ 10%

Straight Balances.....40 & 40 @ 10%

Circular Balances.....50 & 50 @ 10%

Large Dial.....50 & 50 @ 10%

## Barb Wire—

See Wire, Barb.

## Bars—

Crow—

Steel Crowbars, 10 to 40 lb.

per lb., 2 1/2 @ 3¢

## Towel—

No. 10 Ideal, Nickel Plate, 10 gro. \$8.50

## Beams, Scale—

Scale Beams.....40%

Chattillon's No. 1.....30%

Chattillon's No. 2.....40%

## Beaters, Carpet—

Holt Lyon Co.:

Boston Wood Snatch, 50%; Eclipse

Steel, 75%; Hollow Steel, 50 & 10%

Star Wire Rope, 50%; Tarbox Metal

Snatch, 50%; Tarbox New Style

Steel, 50 & 10%; Wire Rope Snatch,

50%.

Lane's Patent Automatic Lock and

Junior.....30%.

See also Machines, Hoisting.

## Boards, Stove—

Paper and Wood Lined.....40%

Embossed.....50%

## Boards, Wash—

See Washboards.

## Bobs, Plumb—

Keuffel & Esser Co. ....33 1/2%

## Beaters, Egg—

Holt Lyon Co.:

Holt, per doz., No. 5, Jap'd, \$0.80;

No. A, Jap'd, \$1.50; No. B, Jap'd, \$1.85;

No. 6, Jap'd, \$1.65;

Lyon, Jap'd, per doz., No. 2, \$1.35.

Taplin Mfg. Co.:

Improved Dover, per gro., No. 60,

\$6.00; No. 75, \$6.50; No. 100, \$7.00;

No. 102, Tin'd, \$8.50; No. 150, Hotel

Tin'd, \$15.00; No. 152, Hotel

Tin'd, \$17.00; No. 200, Tumbler,

\$8.50; No. 202, Tumbler, Tin'd,

\$9.50; No. 300, Mammoth, per

doz., \$25.00.

Taylor & Seymour Mfg. Co.:

T. & S. Dover.....\$6.50

## Bellows—

Blacksmith, Standard List.

Split Leather.....\$6.00 @ 6.50 @ 6.50

Grain Leather.....\$50 @ 50 & 10%

## Hand—

Inch.....6 7 8 9 10

Doz.....\$5.00 5.50 6.00 6.50 7.50

## Molders—

Inch.....10 12 14 16

Doz.....\$7.50 9.00 12.00 15.00

## Bells—

Cow—

Ordinary Goods.....75 & 75 @ 75 & 10%

High grade.....70 & 70 @ 75 & 10%

Jersey.....75 & 10%

Texas Star.....50%

## Door—

Home, R. & E. Mfg. Co.'s.....50 & 10%

## Door—

Ives' Patent Door.....55%

Ives' Wrought Metal.....45%

## Hand—

Polished, Brass.....50 @ 50 & 10%

White Metal.....50 @ 50 & 5%

Nickel Plated.....40 & 10 @ 50%

Swiss.....50 & 10 @ 50 & 10%

Cone's Globe Hand Bells.....33 @ 35%

## Miscellaneous—

Farm Bells.....lb., 2 1/4 @ 2 1/2¢

Church and School.....60 @ 60 & 5%

## Belting—

Leather—

Extra Heavy, Short Lap.....60 & 65%

Regular Short Lap.....60 & 10 & 5%

Standard.....70 & 75

Light Standard.....75 & 80

Cut Leather Lacing.....40 & 45%

Leather Lacing Sides, per sq. ft.

## Expansion—

Richards Mfg. Co. ....50 & 10%

## Plow and Stove—

Plow.....65 & 70 @ 70%

Stove.....33 @ 35 & 5%

## Tire—

Common Iron.....80%

Norway Iron.....80%

American Screw Company:

Norway Phila., list Oct. 16, '84.....80%

East Phila., list Oct. 16, '84.....82 1/2%

Bay State, list Dec. 28, '99.....80%

Franklin Moore Co.:

Hendryx Bronze; Series 700, 800.30%  
Hendryx Enamelled. 35%

**Calipers**—See *Compasses*.

**Calks, Toe and Heel**—

Blunt, 1 prong, per lb., 4 $\frac{1}{4}$  @ 4 $\frac{1}{4}$ ¢  
Sharp, 1 prong, per lb., 4 $\frac{1}{4}$  @ 5 $\frac{1}{4}$ ¢  
Burke's, Blunt, 4 $\frac{1}{4}$ ¢; Sharp, 4 $\frac{1}{4}$ ¢  
Lautier, Blunt, 4 $\frac{1}{4}$ ¢; Sharp, 4 $\frac{1}{4}$ ¢  
Perkins', Blunt, 4 $\frac{1}{4}$  lb., 3 $\frac{1}{2}$ ¢; Sharp, 4 $\frac{1}{4}$  lb., 4.15¢

**Can Openers**—

See *Openers, Can*.

**Caps, Percussion**—

Eley's E. B. . . . . 55@55¢  
G. D. . . . . per M 54@55¢  
F. L. . . . . per M 40@40¢  
G. B. . . . . per M 38@50¢  
Musket . . . . . per M 58@63¢

**Primers**—

Berdan Primers, 82 per M. 20@5%  
Primer Shells and Bullets. 15@10%  
All other primers per M. 31.50@1.00

**Carpet Stretchers**—

See *Stretchers, Carpet*.

**Cartridges**—

**Blank Cartridges**:

32 C. F. . . . . 10@5%  
38 C. F. . . . . 10@5%  
22 cal. Rim. . . . . 10@5%  
32 cal. Rim. . . . . 10@5%  
B. B. Caps, Con. Ball, Sig'd. . . . . 10@5%  
B. B. Caps, Round Ball. . . . . 10@5%  
Central Fire. . . . . 25%  
Target and Sporting Rifle. 15@5%  
Primed Shells and Bullets. 15@10%  
Kim Fire, Sporting. . . . . 50%  
Kim Fire, Military. . . . . 15@5%

**Casters**—

Bed . . . . . 65@10%  
Plate . . . . . 60@5%  
Philadelphia . . . . . 70@10%  
Acme, Ball Bearing. . . . . 30%  
Gem (Boiler Bearing) . . . . . 70@10@10@5%  
Steel Gem. . . . . 20%  
Standard Ball Bearing. . . . . 40%  
Yale (Double Wheel) low list. 40@10%

**Cattle Leaders**—

See *Leaders, Cattle*.

**Chain, Proof Coil**—

American Coil, Straight Link: 5-16 1 $\frac{1}{4}$ , 5-16 3 $\frac{1}{2}$ , 7-16 3 $\frac{1}{2}$ , 9-16 28.77 6.17, 5.02, 4.57, 4.37, 4.27, 4.22 3% 3 $\frac{1}{2}$  to 1 1 $\frac{1}{2}$  to 1 $\frac{1}{4}$  inch. 34.17 4.07, 4.02 4.12  
In case lots, deduct 25%. German Coil . . . . . 60@10@10@70%  
Halter—

Halter Chains . . . . . 60@65%  
German Pattern Halter Chains, list July 24, '97 . . . . . 60@10@5%  
Covert Mfg. Co. . . . . 38@5%

**Cow Ties**—

See *Halters and Ties*.

**Trace, Wagon, &c.**—

Traces, Western Standard: 100 pr. 6 $\frac{1}{2}$ —6-3, Straight, with ring. \$28.00 6 $\frac{1}{2}$ —6-2, Straight, with ring. \$29.00 6 $\frac{1}{2}$ —8-2, Straight, with ring. \$32.00 6 $\frac{1}{2}$ —10-2, Straight, with ring. \$37.00

NOTE.—Add 2¢ per pair for Hooks. Twine Traces; add per pair for Nos. 2 and 3, 2¢; No. 1, 8¢; No. 0, 4¢ to price of Straight Link.

Eastern Standard Traces, Wagons on Chain, &c. . . . . 60%

**Miscellaneous**—

Jack Chain, list July 10, '95: Iron . . . . . 60@10%  
Brass . . . . . 50@10%  
Safety and Plumbers' Chain, 60@10%

Gal. Pump Chain . . . . . lb. 4 $\frac{1}{2}$  @ 4 $\frac{1}{4}$ %  
Covert Mfg. Co.: Breast, Halter, Heel, Rein, Stal-

lion. . . . . 40%  
Oneida Community: American Halter, Dog and Kennel Chains . . . . . 35@21@40%  
Niagara Dog Leads and Kennel Chains . . . . . 45@50@5%

Wire Goods Co.: Dog Chain. . . . . 70%  
Universal Dbl. Jointed Chain. . . . . 50%  
Chain and Ribbon, Sash—

Oneida Community: Steel Chain. . . . . 60%  
Pullman: Bronze Chain, 60%; Steel Chain, 60@10%  
Sash Chain Attachments, per set, 3¢  
Aluminoy Sash Ribbon, per 100 ft. . . . . 41.25@33.00  
Sash Ribbon Attachments, per set, 8¢

**Chalk**—(From Jobbers.)

Carpenters' Blue . . . . . gro. 50@55¢  
Carpenters' Red . . . . . gro. 45@50¢  
Carpenters' White . . . . . gro. 40@45¢  
Checks, Door—

Bardsley's . . . . . 45%  
Pullman, per gro. . . . . 55@50%  
Russwin . . . . . 33 $\frac{1}{2}$ %

### Chests, Tool—

American Tool Chest Co.: Boys' Chests, with Tools. . . . . 50%  
Youths' Chests, with Tools. . . . . 35%  
Gentlemen's Chests, w/ Tools. . . . . 25%  
Farmers', Carpenters', etc., Chests, with Tools. . . . . 25%  
Machinists' and Pipe Fitters' Chests, Empty. . . . . 45%  
Tool Cabinets. . . . . 45%  
C. E. Jennings & Co.'s Machinists' Tool Chests. . . . . 72%

### Chisels—

#### Socket Framing and Firmer

Standard List . . . . . 70@10@75%  
Buck Bros. . . . . 30%

C. E. Jennings & Co.: Socket Firmer No. 10. . . . . 25@7 $\frac{1}{2}$ %  
Socket Framing No. 15. . . . . 25@7 $\frac{1}{2}$ %  
Swan's . . . . . 65@30@70%

L. & I. J. White Co. . . . . 30@30@5%

### Tanged—

Tanged Firmers . . . . . 30@5@35%

Buck Bros. . . . . 30%

C. E. Jennings & Co. Nos. 181, 181. . . . . 25%

L. & I. J. White Co. . . . . 25@5%

### Cold—

Cold Chisels, good quality. 15@15¢

Cold Chisels, fair quality. 11@12¢

Cold Chisels, ordinary. 9@10¢

### Chucks—

Almond Drill Chucks. . . . . 35%

Almond Turret Six-Tool Chuck. . . . . 40%

Emuge. . . . . 35%

Blacksmiths'. . . . . 25%

Jacobs' Drill Chucks. . . . . 35%

Ratt's Positive Drive. . . . . 25%

Skinner Patent Chucks. . . . . 25%

Independent Lathe Chucks. . . . . 35%

Universal, Reversible Jaws. . . . . 35%

Combination, Reversible Jaws. . . . . 35%

Drill Chucks, New Model. . . . . 25%

Standard, 45%; Skinner Pat. . . . . 25%

Positive Drive. . . . . 40%

Planer Chucks. . . . . 20%

Face Plate Jaws. . . . . 35%

Standard Tool Co.: Improved Drill Chuck. . . . . 45%

Union Mfg. Co.: Combination, Nos. 1, 2, 3, 4, 5, 6, 7, 8 and 17, 40%; No. 21. . . . . 35%

Scroll Combination, Nos. 83 and 84. . . . . 35%

Geared Scroll, Nos. 33, 34 and 35. . . . . 25%

Independent Iron, Nos. 18 and 318. . . . . 35%

Independent Steel, No. 61. . . . . 25%

Union Drill, Nos. 000, 00, 100, 101, 102, 103, 104. . . . . 35%

Union Czar Drill. . . . . 25%

Universal, 11, 12, 16, 17, 13, 11, 15, 40%  
Universal, No. 42. . . . . 35%

Iron Face Plate Jaws, Nos. 28, 30, 48 and 50. . . . . 35%

Steel Face Plate Jaws, Nos. 70 and 72. . . . . 30%

Westcott Patent Chucks:

Lathe Chucks. . . . . 50%

Little Giant Auxiliary Drill. . . . . 50%

Little Giant Double Grip Drill. . . . . 50%

Little Giant Drill, Improved. . . . . 50%

Oneida Drill. . . . . 50%

Scroll Combination Lathe. . . . . 50%

### Clamps—

Adjustable, Hammers. . . . . 20@20@5%

Carriage Makers', F. B. C. W. Co. . . . . 50@10%

Rosly, Parallel. . . . . 33@10%

Meyers' Hay Rack. . . . . 45%

Linen's Swedish Neverturn. . . . . 65%

Wood Workers. Hammers. . . . . 10@10%

Saw Clamps, see Vines, Saw Fliers.

**Cleavers, Butchers'**—

Foster Bros. . . . . 30%

Fayette R. Plumb. . . . . 30%

L. & I. J. White Co. . . . . 30%

**Clippers, Horse and Sheep**—

Chicago Flexible Shaft Company:

1902 Chicago Horse, each. \$10.75

20th Century Horse, each. \$15.00

Lightning Belt Horse, each. \$15.00

Chicago Belt Horse, each. \$20.00

Stewart's Enclosed Gear Horse, each. . . . . \$6.75

Stewart's Patent Sheep Shearing Machine, each. . . . . \$12.75

Stewart Enclosed Gear Shearing Machine, No. 8, each. \$9.75

### Clips, Axle—

Regular Styles, list July 1, '05, 80@90@10%

**Cloth and Netting, Wire**—

—See *Wire, &c.*

### Cocks, Brass—

Hardware list:

Plain Bibbs, Globe, Kerosene,

Racking, Liquor, Bottling, &c. . . . . 60@10@65%

Compression Bibbs. . . . . 55@10@60%

**Coffee Mills**—

See Mills, *Coffee*.

### Collars, Dog—

Nickel Chain, Walter B. Stevens &

Son's list. . . . . 40%

Leather, Walter B. Stevens & Son's list. . . . . 40%

**Compasses, Dividers, &c.**—

Ordinary Goods. . . . . 70@10@75%

Wm. Scholhorn Co.:

Excelsior Dividers. . . . . 60%

Lodi Dividers. . . . . 70@10%

### Conductor Pipe,—

L. C. L. to Dealers:

Galvanized

Charcoal Copper, Steel. Iron. 14, 16@20 oz.

Eastern: 70% 50@17 $\frac{1}{2}$ % 30@10%

Central: 70@65% 60% 30@10%

Western and Southern: 70% 55@5% 30@7 $\frac{1}{2}$ %

No. Western: 65@5% 50@5% 30@5%

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.

See also *Eaves Troughs*.

### Coolers, Water—

L. & G. Mfg. Co.:

Gal. 2 3 4 6 8

Galvanized, ea. \$1.85 \$2.00 \$2.25 \$2.90 \$3.90

Galvanized, Lined, side handles, Gal. 2 3 4 6 8

Each. . . . . \$1.95 \$2.15 \$2.40 \$3.30 \$4.15

White Enamelled. . . . . 10%

Agate Lined. . . . . 10%

**Coopers' Tools**—

See *Tools, Coopers'.*

### Coppers' Soldering

Soldering Coppers, 3 lbs. to pair and heavier, 30@33¢; lighter than 3 lb. to pair. . . . . 32@35¢

### Cord—

#### Sash—

Braided, Drab. . . . . lb. 35¢

Braided, White, Com., Nos. 8 to 12, 26 $\frac{1}{2}$ ¢; No. 7, 26 $\frac{1}{2}$ ¢; No. 6, 27 $\frac{1}{2}$ ¢

Cable Laid Italian, lb., No. 18. . . . . 37¢

Italian, lb., A, No. 18, 25¢; B, 22¢

Common India, lb., 11(11) $\frac{1}{2}$ ¢

Cotton Sash Cord, Twisted. 18@20¢

Patent Russia. . . . . lb. . . . . 20¢

Cable Laid Russia. . . . . lb. . . . . 21¢

India Hemp, Br'd. . . . . lb. . . . . 21¢

India Hemp, Twisted. . . . . lb. . . . . 21¢

Patent India. . . . . lb. . . . . 21¢

India Hemp, Drab. . . . . lb. . . . . 21¢

India Hemp, Twisted. . . . . lb. . . . . 21¢

See also *Chain and Ribbon*.

### Clamps—

#### Sash Cord Attachments, per doz. 10¢

Samson, Nos. 8 to 12:

Braided, Drab. . . . . lb. . . . . 12¢

Braided, Italian Hemp. . . . . 10¢@10¢

50¢; Linen, 65¢; White Cotton. . . . . 15¢@15¢

Massachusetts, White. . . . . 10¢@10¢

Massachusetts, Drab. . . . . 10¢@10¢

Phoenix, White, Nos. 8 to 12. . . . . 12¢

Silver Lake, per lb.: A, Drab, 45¢; A, White, 40¢; B, Drab, 40¢; B, White, 35¢; Italian Hemp, 40¢; Linen, 57¢

See also *Chain and Ribbon*.

### Wire, Picture—

List July 10, 1906. . . . . 90@—%

Hendryx Standard Wire Picture Cord, old hat. . . . . 8¢@10¢

Turner & Stanton Co. Wire Picture Cord. . . . . 85@10%

**Cradles—**

Grain. . . . . 40@18 $\frac{1}{2}$ %

**Crayons—**

White Round Crayons, Cases, 100 gro., \$6.50@7.50 at factory, but lower prices made by jobbers

Iwan's Champion, Adjustable. . . . . 50%  
Iwan's Champion, Stationary. . . . . 40%

Turner & Stanton Co. Wire Picture Cord. . . . . 85@10%

**Crow Bars—** See *Bars, Crow*.



D. & H. Scovil..... 30%  
Am. Fork & Hoe Co. (Scovil Pattern)..... 60%

#### Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Cronk's Wedding, No. 1, \$2.00; No. 2, \$2.50  
Star Double Bit..... \$3.20  
Ft. Madison Cotton Hoe..... \$3.20  
Ft. Madison Crescent Cultivator Hoe  
# doz..... \$3.10  
Ft. Madison Mattock Hoe:  
Regular Weight..... \$2.00  
Junior Size..... \$1.90

Ft. Madison Sprouting Hoe, # doz..... \$3.10  
Ft. Madison Dixie Tobacco Hoe..... \$3.50  
Kretzinger's Cut Easy..... \$3.10  
Warren Hoe..... \$3.20  
W. & C. Ivanhoe..... \$3.40  
B. B. 6 in. Cultivator Hoe..... \$3.40  
B. B. 6 in. Hoe..... \$3.50  
Wm. Wedding..... \$2.00, net, \$4.30  
W. & C. L'ning Shuffl' Hoe, # doz..... \$3.25

#### Hoisting Apparatus— See Machines, Hoisting.

#### Holders—Bit—

Angular, \$2.00..... 45&10%  
Door—

Bardsley's, Iron, 40%; Brass and  
Bronze..... 25%  
Empire..... 50%  
Pullman Mfg. Co.: No. 117, Ever-  
ready, 40%; Nos. 118, 119, Sure  
Grip..... 50%  
Superior..... 33%  
File and Tool—

Nicholson File Holders and File  
Handles..... 33&40%  
Fruit Jar—

Triumph Fruit Jar Holder, \$ gross,  
\$10.80; # doz..... \$1.25  
Trace and Rein—

Fernald Double Trace Holder, # doz,  
pairs..... \$1.25  
Dah Rein Holder, # doz, pairs, \$1.25

#### Hones—Razor—

Pike Mfg. Co., Belgian and Swaty,  
50%; German..... 33&1/2%

#### Hooks—Cast Iron—

Bird Cage, Reading..... 40%  
Clothes Line, Reading List..... 40%  
Coat and Hat, Reading..... 45&20%  
Coat and Hat, Wrightsville..... 60&5%  
Harness, Reading List..... 40%  
Wire—

Belt..... 80%  
Wire C. & H. Hooks..... 70@70&10%  
Bradley Metal Clasp Wire, Coat and  
Hat, 70&10%; Ceiling..... 70&10%  
Columbian Hdw. Co., Gem..... 70&5%  
Parker Wire Goods Co., King..... 70&10%  
Wire Goods Co.:  
Acme, 60&10%; Chief, 70%; Crown,  
75%; Carr, 65%; V Brace, 75%;  
Czar Harness, 50&10%;

Wrought Iron—  
Box, 6 in., per doz, \$1.00; 8 in.,  
\$1.25; 10 in., \$1.50.  
Cotton..... \$1.05@\$1.25  
Wrought Staples, Hooks, &c.—  
See Wrought Goods

#### Miscellaneous— Hooks, Bench, see Stools, Bench.

Bush, Light, doz, \$6.20; Medium,  
\$6.75; Heavy, \$7.65

Grass, best, all sizes, per doz \$3.00  
Grass, common grades, all sizes,  
per doz..... \$1.75

Whiffletree..... lb. 5%@6¢  
Hooks and Eyes:  
Brass..... 60@60&10%  
Malleable Iron..... 70@70&10%  
Covers, Mfg. Co., Gate and Scuttle  
Hooks..... 40%  
Ft. Madison Cut-Easy Corn Hooks,  
1 1/2 in. 32.5 n. 1

Turner & Stanton, G. Co., Cup and  
Shoulder..... 30&10%  
Bench Ladders—See Beach Ladders.

Corn Hooks—See Knives, Corn.

#### Horse Nails— See Nails, Horse.

#### Horseshoes— See Shoes, Horses.

#### Hose, Rubber—

Garden Hose, 3/4-inch:  
Competition..... ft. 5 @ 6¢  
3-ply Guaranteed, ft. 8 @ 9¢  
4-ply Guaranteed, ft. 10 @ 11¢

Cotton Garden, 3/4-in., coupled:  
Low Grade..... ft. 8 @ 9¢  
Fair Quality..... ft. 10 @ 11¢

#### Irons—Sad—

From 4 to 10 lb. 3 @ 3¢  
B. B. Sad Irons..... lb. 3@3¢

Mrs. Potts', cents per set:  
Nos. 50 55 60 65

Jap'd Tops..... 83 80 93 91  
Tin'd Tops..... 88 85 98 95

New England Pressing, lb. 3¢@4¢

#### Bar and Corner—

Richards Mfg. Co., Bar, 60&10%:

Corner..... 60%

#### Pinking—

Irons, Soldering..... dos. \$0.60

#### Jacks, Wagon—

Cover Mfg. Co.: Auto Screw, 30&2%; Steel, 45%

Lockport..... 50%

Lane's Steel..... 30&5%  
Richards' Tiger Steel, No. 130..... 50@10%  
Smith & Hemenway Co.'s..... 25%

#### Ladder—

Richards Mfg. Co., Ladder Jacks, 50%

#### Kettles—

Brass, Spun, Plain..... 20@25%  
Enamelled and Cast Iron—See Ware,  
Hollow.

#### Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c..... 30%  
Wilkinson Shear & Cutlery Co. 60%

#### Corn—

Columbian Cutlery Co., Wilcut  
Brand Knives and Hooks..... 60%

Withington Acme, # doz, \$2.65;

Dept. \$2.75; Adj. Serrated, \$2.20;

Serrated, \$2.10; Yankee No. 1, \$1.90;

Yankee No. 2, \$1.15.

#### Drawing—

Standard List..... 75@5@75@10%  
C. E. Jennings & Co., Nos. 45, 46,  
47, 48, 49, 50, 51, 52, 53, 54, 55, 56,  
57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 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553564, 553565, 553566, 553567, 553568, 5

<b>Extractors, Lemon Juice</b> —See <i>Squeezers, Lemon.</i>	<b>Glasses, Level</b> Chapin-Stephens Co. .... 65@65&10%	<b>Chicago Spring Butt Co.:</b> Friction ..... 25% Oscillating ..... 25% Big Twin ..... 25% Chihsolm & Moore Mfg. Co.: Baggage Car Door ..... 50% Elevator ..... 30% Railroad ..... 50% Cronk & Carrier Mfg. Co.: Loose Axle ..... 60&21/2% Roller Bearing ..... 70&21/2% Griffith Mfg. Co.: Solid Axle, No. 10, \$12.00. 60&10% Roller Bearing, No. 11, \$15.00. 60&10% Roller Bearing, Ex. Hy. No. 22, \$18.00. 60&10% Bull Dog, \$24.00. 70% Lane Bros. Co.: Parlor, Ball Bearing, \$1.00. Standard, \$3.15; No. 105, \$2.85. New Model, \$2.80; New Champion, \$2.25 Barn Door Standard ..... 60&10% Hinged ..... net \$6.08 Covered ..... 60&5% Special ..... 70&5% Lawrence Bros.: Advance ..... 55&10% Cleveland ..... 70&71/2% Clipper, No. 75 ..... 60% Crown ..... 55&10% Cyclone, No. 40 ..... net \$6.50 Tandem, No. 50 ..... net \$7.50 New York ..... 55&10% McKinney Mfg. Co.: Roller Bearing, Nos. 1 and 2. 70% Anti-Friction ..... 60% Hinged Hangers, King Charm, 60% Meyers' Stayon Hangers ..... 60% Richards Mfg. Co.: Hangers, Nos. 47, 48, 117, 247, 60&5% Pioneer Wood Track, No. 3, \$2.25 Roller Brg. Stl' Track No. 12, \$2.20 Roller Brg. Stl' Track No. 13, \$2.50 Roller Brg., Nos. 39, 41, 43, 70&71/2% Hero, Adj. Track No. 19, 50&10% Adjustable Track Tandem, Trolley Track No. 16, 50&10% Seal, Steel Track No. 8, \$2.25 Auto Adj. Track No. 22, 50&5% Trolley B. D., No. 17, \$2.25; F. D., No. 120, \$2.25; No. 121, \$2.45; No. 150, \$2.50 Safety Underwriters F. D. No. 101 ..... 50% Tandem, No. 44, 21/2 and 3, 60&10% Place, Adjustable Track No. 132 ..... 50&5% Royal, Adjustable Track No. 122 ..... 50&10% Ives' Wood Track No. 1, \$2.25 Trolley B. D., No. 20, \$2.10; Trolley B. D., No. 24, \$1.30; No. 27, \$1.40; No. 28, \$1.60 Riveter Bearings, Nos. 37, 38, 39, 41, 43, 44, Sizes 1 and 2. 70&71/2% Anti-friction, No. 42; No. 44, sizes 21/2 and 3 ..... 60% Hinged Tandem No. 48, 60&5% Folding Door B. B. Swivel No. 135 ..... 40% Taylor & Boggs Fy Co.'s Kidder's Roller Bearing, 50&15&10&5% <b>Hangers—Garment</b> Pullman Trouser, \$1 gro., 1 pair Flat Aluminum, \$0.00; 1 pair Round Nickel, \$0.00; 4 pair Round Nickel, \$2.00; 1 pair Flat Gun Metal, \$2.00; 1 pair Flat Black Enamelled, \$7.50; 1 pair Wood Clamp, \$13.50; Skirt Hangers, Folding, per gro., \$2.00; Garment Hanger Rods, Round Nickel, per gro., \$10.50; Garment Hanger Loops, Round Nickel, per gro. .... \$10.50 Victor Folding ..... \$1 gro. \$9.00 <b>Gate</b> Myers' Patent Gate Hangers, \$1 doz. net ..... \$1.50 <b>Joist and Timber</b> Lane Bros. Co. .... 30% <b>Hasps</b> Griffith's Security Hasp ..... 50&10% McKinney's Perfect Hasp, \$1 doz. 60% <b>Hatchets</b> Regular list, first qual. 50&71/2%— Second quality ..... 50&10% <b>Heaters, Carriage</b> Clark, No. 5, \$1.75; No. 5B, \$2.00; No. 3, \$2.25; No. 3D, \$2.75; No. 7D, \$3.00; No. 3E, \$3.25; No. 1, \$3.50, .... 55% Clark Coal, \$1.75 ..... 20% <b>Hinges</b> <b>Blind and Shutter Hinges</b> Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.) No. 1 3 5 Doz. pair ..... \$0.75 1.35 2.70 Mortise Shutter: (L. & P., O. S., Dixie, &c.) No. 1 1/4 2 2 1/2 Doz. pair ..... \$0.70 1.65 3.60 5.65 Mortise Reversible Shutter (Buffalo, &c.): No. ..... 1 1/2 2 Doz. pair ..... \$0.70 1.65 .60 North's Automatic Blind Fixtures, No. 2, for Wood, \$9.00; No. 3, for Brick, \$11.50, .... 10% Charles Parker Co. .... 70&75% Parker Wire Goods Co.: Hale & Benjamin Automatic Blind Hinges ..... 20% Hale's Blind Awning Hinges, No. 110, for wood, \$9.00; No. 111, for brick, \$9.00, .... 20% Reading's Gravity ..... 60% Stanley's Steel Gravity Blind Hinges, No. 187 1/2, \$9 doz. sets, without screws, \$1.25 Wrightsville Hardware Co.: O. S., Lull & Porter ..... 75&5% Acme, Lull & Porter ..... 75% Queen City Reversible ..... 75% Shepard's Noiseless, Nos. 62 ..... 75&5% Niagara, Gravity Locking, 3 & 5, \$7.50% Tip Pat'n, No. 1 ..... 75&10% No. 3 ..... 75&5% Buffalo, Gravity Locking, Nos. 1 & 5, \$7.50% Shepard's Double Locking ..... 75% Champion Gravity Locking ..... 75&5% Pioneer ..... 75&10% Empire ..... 65% W. H. C. & Mortise Gravity Locking, No. 2 ..... 60&10% <b>Gate Hinges</b> Clark's or Shepard's—Doz. sets: No. ..... 1 2 3 Hinges with L'f'chs. \$2.00 2.70 5.00 Hinges only ..... 1.40 2.05 3.80 Latches only ..... 70 70 35 <b>New England:</b> With Latch ..... doz. .... @ \$2.00 Without Latch ..... doz. .... @ \$1.60 Reversible Self-Closing: With Latch ..... doz. .... @ \$1.75 Without Latch ..... doz. .... @ \$1.35 <b>Western:</b> With Latch ..... doz. \$1.75 Without Latch ..... doz. \$1.15 Wrightsville Hardware Co.: Shepard's or Clark's Hinges and Latches, Hinges only or Latches only, Nos. 1, 2 or 3, .... 70% <b>Pivot Hinges</b> Bommer Bros. Pivot ..... 40% Lawson Mfg. Co. Matchless ..... 50% <b>Spring Hinges</b> Holdback, Cast Iron, \$6.75 @ \$7.00 Non-Holdback, Cast Iron \$6.50 @ \$6.75 <b>J. Bardley:</b> Bardley's Non-Checking Mortise Floor Hinges ..... 40% Bardley's Patent Checking 33 1/3% Bommer Bros.: Bommer Ball Bearing Floor, 40% Bommer Spring Hinges ..... 40% No. 999 Wrot Steel Hold Back, \$4 gr. \$9.00 Chicago Spring Butt Co.: Chicago Spring Hinges ..... 25% Triplex End Spring Hinges ..... 50% Chicago (Ball Bearing) Floor ..... 50% Garden City Engine House ..... 25% Keene's Saloon Door ..... 25% Columbian Hardware Co.: Acme, Wrought Steel ..... 30% Acme, Brass ..... 25% American ..... 30% Columbia, \$4 gr. No. 14, \$9.00; No. 18, \$25.00 Columbia, Adj. No. 7, \$4 gr. \$12.00 Columbian Hinges ..... 60&10% Gem, new list ..... 30% Clover Leaf ..... \$4 gr. \$12.00 Oxford, new list ..... 30% Floor Spring Hinges ..... 65&10% Lawson Mfg. Co. Matchless ..... 30% Richards Mfg. Co.: Superior Double Acting Floor Hinges ..... 40% Shelby Spring Hinge Co.: Shelby All Steel Holdback Screen Door, \$4 gr. \$9.00 Chief Ball Bearing Floor Hinge ..... 50% Ball Bearing Door ..... 25% No. 777, Sheet Steel Holdback, \$4 gr. \$9.00 Superior Spring Hinge Co.: Superior Floor Hinges ..... 33 1/3% <b>Wrought Iron Hinges</b> Strap and T Hinges, &c., list December 20, 1904: Light Strap Hinges, 50&10% Heavy Strap Hinges, 60&5% Light T Hinges ..... 50% Heavy T Hinges ..... 40% Extra Heavy T Hinges, 50&10% Hinge Hasps ..... 33 1/3% Cor. Heavy Strap ..... 60&5% Cor. Ex. Heavy T ..... 50&10% <b>Screw Hook</b> { 8 to 12 in. lb. 5% and Strap. { 14 to 20 in. lb. 5% 22 to 36 in. lb. 5% <b>Screw Hook and Eye</b> : 1/4 to 1 inch ..... lb. 61/4% 1/2 inch ..... lb. 71/4% 1/2 inch ..... lb. 81/4% <b>Hitchers, Stall</b> Covert Mfg. Co. Stall Hitchers, 30&2% <b>Hobs—Coal</b> Mfg'r's list, price per gross: Inch ..... 15 16 17 18 Galv. Open ..... \$35 \$39 \$32 \$36 Jap. Open ..... 26 28 31 35 Galv. Funnel, 43 48 52 56 Jap. Funnel, 33 36 39 43 <b>Masons' Etc.</b> Cleveland Wire Spring Co.: Steel Brick, No. 182, .... each \$1.05 Steel Mortar, No. 198, .... each \$1.35 <b>Hoses—Eye</b> Scovil and Oral Pattern ..... 60&10@60&10&10% Grub, list Feb. 23, 1899 ..... 60&10@65&10% Extra 1/2% of gen on most of these lines
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D. & H. Scovil.....30%  
Am. Fork & Hoe Co. (Scovil Pattern).....60%

#### Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.  
Cronk's Weeding, No. 1, \$2.00; No. 2, \$2.50  
Star Double Bit.....\$3.20  
Ft. Madison Cotton Hoe.....70¢ 10¢ 10¢  
Ft. Madison Crescent Cultivator Hoe.....70¢ 10¢  
Ft. Madison Mattock Hoe.....\$1.00  
Regular Weight.....\$1.00  
Junior Size.....\$1.00  
Ft. Madison Sprouting Hoe.....\$1.00  
Ft. Madison Dixie Tobacco Hoe.....75¢ 10¢ 7¢ 10¢  
Kretzinger's Cut Easy.....70¢ 10¢  
Warren Hoe.....45¢ 10¢  
W. & C. Ivanhoe.....75¢ 2¢  
B. B. 6 in. Cultivator Hoe.....\$3.40  
B. B. 6½ in......\$3.50  
W. C. Wedding.....\$1.00  
W. & C. L'ning Shuffle Hoe, #doz.....\$2.25

#### Hoisting Apparatus— See Machines, Hoisting.

#### Holders—Bit—

Angular, # doz. \$24.00.....45¢ 10¢  
Door—  
Bardale's, Iron, 40%; Brass and Bronze.....25%  
Empire.....50%  
Pullman.....35%  
Richards Mfg. Co.: Nos. 117, Ever-ready, 40%; Nos. 118, 119, Sure Grip.....50%  
Superior.....33½%

#### File and Tool—

Nicholson File Holders and File Handles.....33½@40%

#### Fruit Jar—

Triumph Fruit Jar Holder, # gross, \$10.80; # doz. ....\$1.25

#### Trace and Rein—

Fernal Double Trace Holder, # doz, pairs.....\$1.25  
Dash Rein Holder, # doz, pairs.....\$1.25

#### Hones—Razor—

Pike Mfg. Co., Belgian and Swaty, 50%; German.....33½%

#### Hooks—Cast Iron—

Bird Cage, Reading.....40%  
Clothes Line, Reading List.....40%  
Coat and Hat, Reading.....45¢ 20¢  
Coat and Hat, Wrightsville.....60¢ 5¢  
Harness, Reading List.....40%  
Wire—  
Belt.....80%  
Wire C. & H. Hooks.....70¢ 70¢ 10¢  
Bradley Metal Clasp Wire, Coat and Hat, 70¢ 10¢; Ceiling.....70¢ 10¢  
Columbian Hr. Co., Gem.....70¢ 5¢  
Parker Wire Goods Co., King.....70¢ 10¢  
Wire Goods Co.:  
Acme, 60¢ 10%; Chief, 70%; Crown, 75%; Czar, 65%; V Brace, 75%;  
Czar Harness, 50¢ 10%.

#### Wrought Iron—

Box, 6 in., per doz., \$1.00; 8 in., \$1.25; 10 in., \$2.00.  
Cotton .....\$1.05@\$1.25  
Wrought Staples, Hoses, &c.—  
See Wrought Goods

#### Miscellaneous—

Hooks, Bench, see Stops, Bench. Bush, Light, doz., \$6.20; Medium, \$6.75; Heavy, \$7.65  
Grass, best, all sizes, per doz. \$3.00  
Grass, common grades, all sizes, per doz. ....\$1.75  
Whistletree .....1b. 5¢@6¢  
Hocks and Eyes:  
Brass .....60@60¢ 10¢  
Malleable Iron.....70¢ 70¢ 10¢  
Cover, Mfg. Co. Gate and Scuttle Hooks.....40%  
Ft. Madison Cut-Easy Corn Hooks, Turner & Stanton Co. 1b. 35¢ n. 1  
Bench Tops—See Bench Tops.  
Corn Hooks—See Knives, Corn.

#### Horse Nails—

See Nails, Horse.

#### Horseshoes—

See Shoes, Horses.

#### Hose, Rubber—

Garden Hose, ¾-in.:  
Competition .....ft. 5 @ 6¢  
3-ply Guaranteed, ft. 8 @ 9¢  
4-ply Guaranteed, ft. 10 @ 11¢  
Cotton Garden, ¾-in., coupled:  
Low Grade .....ft. 8 @ 9¢  
Fair Quality .....ft. 10 @ 11¢  
Irons—Sad—  
From 4 to 10 lb. 3 @ 5¢@4¢  
B. B. Sad Irons.....lb. 3¢@3½¢  
Mrs. Potts', cents per set:  
Nos. 50 55 60 65  
Jap'd Tops .....83 89 93 91  
Tin'd Tops .....88 85 98 95  
New England Pressing, lb. 3¢@4¢

#### Bar and Corner—

Richards Mfg. Co., Bar, 60¢ 10%;  
Corner .....60%

#### Pinking—

Pinking Irons.....doz. \$0.60

#### Irons, Soldering—

See Copper.

#### Jacks, Wagon—

Covert Mfg. Co.:  
Auto Screw.....30¢ 2%; Steel, 45%  
Lockport .....50%

Lane's Steel.....30¢ 5%  
Richards Tiger Steel, No. 130.....50¢ 10%  
Smith & Hemenway Co.'s.....55%

#### Ladder—

Richards Mfg. Co., Ladder Jacks, 50%  
Kettles—  
Brass, Spun, Plain.....20¢@25%  
Enameled and Cast Iron—See Ware, Hollow.

#### Knives—

Butcher, Kitchen, &c.—  
Foster Bros. Butcher, &c. ....30%  
Wilkinson Shear & Cutlery Co. ....60%

#### Corn—

Columbian Cutlery Co., Wilcut  
Brand Knives and Hooks.....60%  
Washington Acme, # doz. \$2.65;  
Dent, \$2.75; Adj. Serrated, \$2.20;  
Serrated, \$2.10; Yankee No. 1, \$1.50;  
Yankee No. 2, \$1.15.

#### Drawing—

Standard List.....75¢@75¢ 10%  
C. E. Jennings & Co., Nos. 45, 46, 47, 48, 49, 50%  
Jennings & Griffin, Nos. 41, 42, 43, 44, 45, 46, 47, 48, 49, 50%  
Swan's .....66¢@70%  
Watrous .....16¢  
L. & J. J. White.....20¢@25%  
Hay and Straw—  
Serrated Edge, per doz. \$5.50@5.75  
Ivan's Sickle Edge.....# doz. \$9.50  
Ivan's Serrated.....# doz. \$10.00

#### Miscellaneous—

Farrister's .....doz. \$8.00@8.25  
Wostenholm's .....# doz. \$3.00@3.25

#### Knobs—

Base, 2½-inch, Birch, or Maple, Rubber Tip.....gro. \$1.25@\$1.40  
Carriage, Jap., all sizes.....gro. 40¢@45¢

Door, Mineral .....doz. 65¢@70¢  
Door, Por. Jap'd .....doz. 70¢@75¢  
Door, Por. Nickel .....doz. \$2.05@2.15  
Bardale's Wood Door, Shutters, &c. 15%

Lacing, Leather—  
See Belting, Leather.

Ladders, Store, &c.—

Allith Mfg. Co., Reliable.....50%  
Lane's Store.....25%  
Myers' Noiseless Store Ladders.....35%  
Richards Mfg. Co.:  
Improved Noiseless, No. 112.....50%  
Climax Shelf, No. 113.....50%  
Trolley, No. 109.....50%  
Ladies, Melting—

L. & G. Mfg. Co. (low list).....20%  
P. S. & W. .....40¢@10%  
Leading .....60%

Lanterns—Tubular—

Regular, No. 0, ....doz. \$5.35@4.50  
Side Lift, No. 0, ....doz. \$4.60@4.75  
Hinge Globe, No. 0, doz. \$4.60@4.75  
Other Styles .....40¢@40¢@10%

Bull's Eye Police—  
3-inch .....\$3.25@4.50

Latches—Thumb—  
Roggins' Latches, with screw.....doz. 35¢@40¢

#### Door—

Allith Mfg. Co., Reliable and Alligator, 50%; Reliable Cold Storage, 50%; Cronk & Carrier Mfg. Co., No. 101, 50%; Richards' Bull Dog, Heavy, No. 12, 50%; Richards' Trump, No. 127.....50%  
Leaders, Cattle—  
Small .....doz. 50¢; large, 60¢  
Covert Mfg. Co.:  
Cotton, 45%; Hemp, 45%; Jute, 35%;  
Sisal, 20%.

Leathers, Pump—  
See Pumps—

Lifters, Transom—

R. & E. .....10%

Lines—

Silk Clothes, Nos. 18 .....19 20  
100 feet .....\$2.50 2.25 2.00  
75 feet .....\$1.75 1.55 1.10

Swanson Cordage Works:

Solid Braided Chalk, Nos. 0 to 3, 40%  
Solid Braided Masons' .....30%

Silver Lake Braided Chalk, No. 0, 50%; No. 1, 36.50; No. 2, 37.00; No. 3, 37.50

Masons' Lines, Shade Cord, &c.:

White Cotton, No. 3½, \$1.50; No. 4, \$2.00; No. 4½, \$2.50; Colors, No. 3½, \$1.75; No. 4, \$2.25; No. 4½, \$2.75; Linen, No. 3½, \$2.50; No. 4, \$3.50; No. 4½, \$4.50

Tent and Awning Lines: No. 5, White Cotton, \$7.50; Drab Cotton, \$8.50

Clothes Lines, White Cotton: 50 ft., \$1.75; 60 ft., \$2.25; 70 ft., \$2.75; 75 ft., \$3.00; 80 ft., \$3.25; 90 ft., \$3.75; 100 ft., \$3.50; 125 ft., \$4.25

Turner & Stanton Co.:

Solid Braided Chalk, Masons' and Awning Lines.....40%  
Clothes Lines, White Cotton.....20%  
Shade Cord, Cotton or Linen.....20%

Locks—Cabinet—

Cabinet Locks.....\$3.14%

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.

Reading Hardware Co. ....40%  
R. & E. Mfg. Co. ....40%

Padlocks—

R. & E. Mfg. Co., Wrought Steel and Brass.....75¢@15%

Sash, &c.—

Ives' Patent: Bronze and Brass, 55¢@5%; Crescent, 60%; Iron, 60%; Window Ventilating, 40¢@20%; Robinson Pat. Ventilating Sash Lock, 33½%.

Pullman Patent Ventilating Lock, 35%  
Reading Sash Locks.....50%

#### Machines—Boring—

Com. Upr't, without Augers, \$2.00@2.25

Com. Angl'r, without Augers, \$2.25@2.50

Swan's Improved.....40¢@10%

Jennings', Nos. 1 and 4.....25¢@2½%

Millers' Falls.....5.75

Smell's, Upright, \$2.65; Angular, \$2.90

Corking—

Kreisiger Invincible Hand Power, \$1 doz. \$18.00

#### Fence—

Williams' Fence Machines, each, \$5.50

#### Hoisting—

Moore's Anti-Friction Chain Hoist, 30%  
Moore's Hand Lifter, 30%  
Moore's Cyclon, High Speed Chain Hoist

#### Ice Cutting—

Chandler's .....12½%

#### Washing—

Boss Washing Machine Co.: Per doz.  
Boss No. 1, .....\$57.00  
Boss No. 2, .....\$60.00  
Champion Rotary Brush, No. 1, .....\$57.00  
Standard Champion No. 1, .....\$60.00  
Standard Perfecter, .....\$6.00  
Cincinnati Square Western, .....\$33.00  
Unceda American, Round, .....\$6.00

#### Mallets—

Hickory .....45¢@50%  
Lignumvitae .....45¢@50%  
Tinners' Hickory and Apple-wood .....doz. 45¢@50%

#### Mangers, Stable—

Swett Iron Works, .....50%

#### Mats, Door—

Elastic Steel (W. G. Co.), new list, 50%  
Keystone Wire Matting Co.:  
Keystone .....50%  
Ideal .....50%

#### Mattocks—

See Picks and Mattocks.

#### Milk Cans—

See Cans, Milk.

#### Mills, Coffee, &c.—

Enterprise Mfg. Co. ....20@25%

Parker's Columbia and Victoria, 33½%

Parker's Box and Side, .....50@10%

Swift, Lane Bros. Co. ....25%

#### Motors Water—

Divine's Red Devil, .....30%

#### Mowers, Lawn—

NOTE.—Net prices are generally quoted

Cheapest .....60¢ size, \$1.55@2.00

Cheap .....60¢ size, \$2.00@2.50

Better Grade .....all sizes, \$2.50@4.50

High Grade .....\$4.50 to \$10.00

Continental .....60%

Great American, .....60%

Great American Ball Brg., new list, 10%

Quaker City .....70%

Pennsylvania .....60%

Pennsylvania, Jr., Ball Bearing, 30¢@10%  
Pennsylvania Golf, .....30%

Pennsylvania Horse, .....30%

Pennsylvania Pony, .....40¢@5%

Granite State:

Style A, Low Wheel, .....70¢@10%  
Style B, Low Wheel, .....70¢@5%

Style C, High Wheel, spcl. disc., .....70¢@10%

Style D, High Wheel, spcl. disc., 70%

Philadelphia:

Styles M., S., C., K., T., .....70¢@10%  
Style A, all Steel, .....60¢@10%  
Style E, Light .....60¢@10%  
Drexel and Gold Coin, special list, 10%

Horse .....10¢@5%

Pony .....10¢@5%

36-in. Horse .....30¢@10%  
Eagle Horse .....30¢@5%

E. L. X. Horse .....30¢@5%

#### Nails—

Wire Nails and Brads, Miscellaneous .....87¢@187¢@10%

Cut and Wire. See Trade Report.

Hungarian, Finishing, Upholsterers, &c. See Tacks.

#### Horse—

Nos. 6 7 8 9 10

Anchor .....23 21 20 19 18 16 40@5%

Coleman .....13 12 13 11 11 .....net

New Haven .....23 21 20 19 18 16 40@5%

Livingston .....19 18 17 16 16 16 19%  
Western .....19 18 17 16 16 16 19%  
Jobbers' Special Brands, .....# doz. 8½¢

#### Picture—

per lb. 9¢@10¢

Brass H'd, 45 55 60 70 80 in. ....gro.

Por. Head .....1.10 1.10 1.10 1.10 ....gro.

#### Nippers—

See Pliers and Nippers.

#### Nuts—

Cold Punched: Off list.

Square, Blank or Tapped, 4.80¢

Hexagon, Blank or Tapped, 5.10¢

Square, Blk, C., T. & R. 5.10¢

Hexagon, Blk, C., T. & R. 5.70¢

Hot Pressed:

Square, Blank .....5.00¢

Hexagon, Blank .....5.4¢

Square, Tapped .....4.70¢

Hexagon, Tapped .....5.10¢

Ranger .....5.00¢

Livingston Nail Co.:

Daisy .....# doz. \$1.00

Little Star .....# doz. \$1.00

Rocking Table .....# doz. \$6.20

Reading Hardware Co.:

Advance .....# doz. \$4.00

Baldwin .....# doz. \$4.00

Reading 72 .....# doz. \$3.25

Reading 78 .....# doz. \$6.25

Oil Tanks—See Tanks, Oil.

#### Oilers—

Brass and Copper .....50@10%

**Pinking Irons—**

See Irons, Pinking.

**Pins, Escutcheon—**Brass ..... 50@50&10%  
Iron, list Nov. 11, '05. 60@60&10%**Pipe, Cast Iron Soil—**Standard, 26 in. ..... 50%  
Extra Heavy, 26 in. ..... 60%  
Fittings, Stand. and H'y. ..... 70%**Pipe, Merchant—**

Consumers, Carloads.	
Steel.	Iron.
Blk. Galv.	Blk. Galv.
%	%
1/4 & 1/4 in. 64	48
2/3 in. 66	59
1/2 in. 68	61
2/3 to 6 in. 72	62
7 to 12 in. 69	61
	46

**Pipe, Vitrified Sewer—**Carload lots.  
Standard Pipe and Fittings, 3 to 24 in., f.o.b. factory:  
First-class ..... 82%  
Second-class ..... 85%

NOTE.—Market irregular.

**Pipe, Stove—**

Per 100 joints.	
Edwards' Nested:	C. L. L. C. L.
5 in., Standard Blue.	\$.25
6 in., Standard Blue.	7.75
7 in., Standard Blue.	7.75
8 in., Royal Blue.	7.75
9 in., Royal Blue.	8.00
10 in., Royal Blue.	8.50
11 in., Royal Blue.	9.50
Wheeling Corrugating Co.'s Nested:	
5 in., Uniform Color.	\$.15
6 in., Uniform Color.	6.65
7 in., Uniform Color.	7.65

**Planes and Plane Irons—****Wood Planes—**

Bench, first qual.	30@30&10%
Bench, second qual.	40@40&10%
Molding.	25@25&10%
Chapin-Stephens Co.:	
Bench, First Quality.	30%
Bench, Second Quality.	40%
Molding and Miscellaneous.	25%
Toy and German.	30%
Union	60%

**Iron Planes—**

Chaplin's Iron Planes.	50&10%
Union	60%

**Plane Irons—**

Wood Bench Plane Irons, list Dec. 12, '06.	25%
Buck Bros.	30%
Chapin-Stephens Co.	25%
Union	50%
L. & I. J. White.	20&5@25%

**Planters, Corn, Hand—**

Kohler's Eclipse.	per doz. \$8.00
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**Plates—**

Feiloe	lb. 4@4@4
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**Pliers and Nippers—**

Button Pliers.	75@75&10%
Gas Burner, per doz., 5 in., 21.25 @ \$1.50; 6 in., \$2.45 @ \$1.50.	
Gas Pipe.. 7	8
8	10
10	18-in.
Gas Pipe.. 7	8
8	22.25
10	22.75
10	33.50

Acme Nippers.	50&5%
Cronk & Carrier Mfg. Co.:	
American Button.	80%
Improved Button.	75@10%
Cronk's	60%
No. 50 Lineman's.	50%
Stub's Pattern.	45%
Combination and others.	33%
Heller's Farriers' Nippers, Pincers and Tools.	40&50@10&15%
P. S. & W. Timmer's Cutting Nippers.	40&50@10&15%
Wm. Schollhorn Co.:	
Bernard, 35%; Elm City, 35%; Paragon, 50%; Lodi, 55%.	
Swedish Side, End and Diagonal Cutting Pliers.	50%
Utica Drop Forge & Tool Co.:	
Pliers and Nippers, all kinds.	40%

**Plumbs and Levels—**

Chapin-Stephens Co.:	
Plumbs and Levels.	30@30&10%
Chapin's Imp. Brass Cor.	40@40&10%
Pocket Levels.	30@30&10%
Extension Sights.	30@30&10%
Machinists' Levels.	40@40&10%
Douston's Plumbs and Levels.	50&10%
Douston's Pocket Levels.	50&10%
Stanley's Duplex.	35%
Woods' Extension.	33@3%

**Points, Glaziers'—**

Bulk and 1-lb. papers.	lb. 16@16@16
1/2-lb. papers.	lb. 9@10@16
1/4-lb. papers.	lb. 5@6@16

**Police Goods—**

Manufacturers' Lists.	25@25@25
Tower's	25@25

**Polish—Metal, Etc.—**

Prestoline Liquid, No. 1 (4 pt.).	per doz. \$3.00; No. 2 (1 qt.), \$9.00. 40%
Prestoline Paste.	

George William Hoffman:  
U. S. Metal Polish Paste, 3 oz. boxes, per doz. 50¢; per gro. \$1.00; 1/2 lb. boxes, per doz. \$1.25; 1 lb. boxes, per doz. \$2.25.  
U. S. Liquid, 8 oz. cans, per doz. \$1.25.  
Barkeepers' Friend Metal Polish, per doz. \$1.75.

**Stove—**

Black Eagle Benzine Paste, 5 lb. cans, per doz. 10¢.  
Black Eagle, Liquid, 1/2 pt. cans, per doz. 75¢.  
Black Jack Paste, 1/2 lb. cans, per gr. \$0.50.  
Black Kid Paste, 5 lb. cans, each, per doz. 80¢.  
Ladd's Black Beauty Liquid, per 100 tins. \$0.75.  
Josephine Dixon's, per gr. 75¢.  
Dixon's Plumbago, per doz. 8¢.  
Fireside's, per gr. \$2.50.  
Gem, per gr. \$1.50.  
Japanese, per gr. 50¢.  
Jet Black, per gr. 50¢.  
Peerless Iron Enamel, 10 oz. cans, per doz. \$1.50.

**Popers, Corn—**

1 qt. Square.. doz. \$0.88; gro. \$8.75.  
1 qt. Round.. doz. \$1.00; gro. \$10.00.  
1/2 qt. Square.. doz. \$1.10; gro. \$11.00.  
2 qt. Square.. doz. \$1.35; gro. \$13.50.

**Post Hole and Tree Augers and Diggers—**

See also Diggers, Post Hole, &amp;c.

**Posts, Steel—**

Steel Fence Posts, each, 6 ft., 4¢;  
6 ft., 4¢; 6¢; 8¢.  
Steel Hitching Posts.....each \$1.30

**Potato Parers—**

See Parers, Potato.

**Pots, Glue—**

Enamelled ..... 35¢@10%  
Tinned ..... 30¢@10%

**Powder—**

In Canisters:  
Duck, 1 lb. .... each 45¢  
Fine Sporting, 1 lb. .... each 75¢  
Rifle, 1/2 lb. .... each 25¢  
Rifle, 1-lb. .... each 25¢

**Keys—**

12½-lb. keys ..... \$3.50  
25-lb. keys ..... \$4.50

King's Semi-Smokeless:

Keg (25 lb. bulk) ..... \$6.50  
Half Keg (12½ lb. bulk) ..... \$3.50  
Quarter Keg (6½ lb. bulk) ..... \$1.50  
Case 24 (1 lb. can bulk) ..... \$8.50

King's Smokeless:

Shot Gun, Rifle, Keg (25 lb. bulk) ..... \$12.00  
Half Keg (12½ lb. bulk) ..... \$6.25  
Quarter Keg (6½ lb. bulk) ..... 3.25  
Case 24 (1 lb. can bulk) ..... 14.00  
Half case 12 (1 lb. c. bulk) ..... 7.25

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Case 24 (1 lb. can bulk) ..... 14.00  
Half case 12 (1 lb. c. bulk) ..... 7.25

King's Smokeless:

Shot Gun, Rifle, Keg (25 lb. bulk) ..... \$12.00  
Half Keg (12½ lb. bulk) ..... 6

**Saws—**

Atkins':	45%
Circular	45%
Band	50@50&10%
Butcher Saws	50%
Cross Cuts	35%
One-Man Cross Cut	40%
Narrow Cross Cut	50%
Hand, Rip and Panel	35&5%
Miter Box and Compass	40%
Mulay, Mill and Drag	45%
Wood Saws	40&10%

Chapin-Stephens Co.:  
Tuning Saws and Frames, 30@30&10%

Diamond Saw & Stamping Works:  
Sterling Kitchen Saws, 30@10&10%

Diston's:

  Circular, Solid and Invited Tooth, 50%

  Band, 2 to 18 in. wide, 60%

  Band, 1/4 to 1 1/4, 60%

  Crosscuts, 45%

  Narrow Crosscuts, 50%

  Mulay, Mill and Drag, 50%

  Framed Woodsaws, 25%

  Wood saws, 25%

  Wood saw rods, Tinned, 15%

  Hand saws, Nos. 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 40, 42, 44, 46, 48, 50, 52, 54, 56, 58, 60, 62, 64, 66, 68, 70, 72, 74, 76, 78, 80, 82, 84, 86, 88, 90, 92, 94, 96, 98, 100, 102, 104, 106, 108, 110, 112, 114, 116, 118, 120, 122, 124, 126, 128, 130, 132, 134, 136, 138, 140, 142, 144, 146, 148, 150, 152, 154, 156, 158, 160, 162, 164, 166, 168, 170, 172, 174, 176, 178, 180, 182, 184, 186, 188, 190, 192, 194, 196, 198, 200, 202, 204, 206, 208, 210, 212, 214, 216, 218, 220, 222, 224, 226, 228, 230, 232, 234, 236, 238, 240, 242, 244, 246, 248, 250, 252, 254, 256, 258, 260, 262, 264, 266, 268, 270, 272, 274, 276, 278, 280, 282, 284, 286, 288, 290, 292, 294, 296, 298, 300, 302, 304, 306, 308, 310, 312, 314, 316, 318, 320, 322, 324, 326, 328, 330, 332, 334, 336, 338, 340, 342, 344, 346, 348, 350, 352, 354, 356, 358, 360, 362, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 388, 390, 392, 394, 396, 398, 400, 402, 404, 406, 408, 410, 412, 414, 416, 418, 420, 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1184, 1186, 1188, 1190, 1192, 1194, 1196, 1198, 1200, 1202, 1204, 1206, 1208, 1210, 1212, 1214, 1216, 1218, 1220, 1222, 1224, 1226, 1228, 1230, 1232, 1234, 1236, 1238, 1240, 1242, 1244, 1246, 1248, 1250, 1252, 1254, 1256, 1258, 1260, 1262, 1264, 1266, 1268, 1270, 1272, 1274, 1276, 1278, 1280, 1282, 1284, 1286, 1288, 1290, 1292, 1294, 1296, 1298, 1300, 1302, 1304, 1306, 1308, 1310, 1312, 1314, 1316, 1318, 1320, 1322, 1324, 1326, 1328, 1330, 1332, 1334, 1336, 1338, 1340, 1342, 1344, 1346, 1348, 1350, 1352, 1354, 1356, 1358, 1360, 1362, 1364, 1366, 1368, 1370, 1372, 1374, 1376, 1378, 1380, 1382, 1384, 1386, 1388, 1390, 1392, 1394, 1396, 1398, 1400, 1402, 1404, 1406, 1408, 1410, 1412, 1414, 1416, 1418, 1420, 1422, 1424, 1426, 1428, 1430, 1432, 1434, 1436, 1438, 1440, 1442, 1444, 1446, 1448, 1450, 1452, 1454, 1456, 1458, 1460, 1462, 1464, 1466, 1468, 1470, 1472, 1474, 1476, 1478, 1480, 1482, 1484, 1486, 1488, 1490, 1492, 1494, 1496, 1498, 1500, 1502, 1504, 1506, 1508, 1510, 1512, 1514, 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1848, 1850, 1852, 1854, 1856, 1858, 1860, 1862, 1864, 1866, 1868, 1870, 1872, 1874, 1876, 1878, 1880, 1882, 1884, 1886, 1888, 1890, 1892, 1894, 1896, 1898, 1900, 1902, 1904, 1906, 1908, 1910, 1912, 1914, 1916, 1918, 1920, 1922, 1924, 1926, 1928, 1930, 1932, 1934, 1936, 1938, 1940, 1942, 1944, 1946, 1948, 1950, 1952, 1954, 1956, 1958, 1960, 1962, 1964, 1966, 1968, 1970, 1972, 1974, 1976, 1978, 1980, 1982, 1984, 1986, 1988, 1990, 1992, 1994, 1996, 1998, 2000, 2002, 2004, 2006, 2008, 2010, 2012, 2014, 2016, 2018, 2020, 2022, 2024, 2026, 2028, 2030, 2032, 2034, 2036, 2038, 2040, 2042, 2044, 2046, 2048, 2050, 2052, 2054, 2056, 2058, 2060, 2062, 2064, 2066, 2068, 2070, 2072, 2074, 2076, 2078, 2080, 2082, 2084, 2086, 2088, 2090, 2092, 2094, 2096, 2098, 2100, 2102, 2104, 2106, 2108, 2110, 2112, 2114, 2116, 2118, 2120, 2122, 2124, 2126, 2128, 2130, 2132, 2134, 2136, 2138, 2140, 2142, 2144, 2146, 2148, 2150, 2152, 2154, 2156, 2158, 2160, 2162, 2164, 2166, 2168, 2170, 2172, 2174, 2176, 2178, 2180, 2182, 2184, 2186, 2188, 2190, 2192, 2194, 2196, 2198, 2200, 2202, 2204, 2206, 2208, 2210, 2212, 2214, 2216, 2218, 2220, 2222, 2224, 2226, 2228, 2230, 2232, 2234, 2236, 2238, 2240, 2242, 2244, 2246, 2248, 2250, 2252, 2254, 2256, 2258, 2260, 2262, 2264, 2266, 2268, 2270, 2272, 2274, 2276, 2278, 2280, 2282, 2284, 2286, 2288, 2290, 2292, 2294, 2296, 2298, 2300, 2302, 2304, 2306, 2308, 2310, 2312, 2314, 2316, 2318, 2320, 2322, 2324, 2326, 2328, 2330, 2332, 2334, 2336, 2338, 2340, 2342, 2344, 2346, 2348, 2350, 2352, 2354, 2356, 2358, 2360, 2362, 2364, 2366, 2368, 2370, 2372, 2374, 2376, 2378, 2380, 2382, 2384, 2386, 2388, 2390, 2392, 2394, 2396, 2398, 2400, 2402, 2404, 2406, 2408, 2410, 2412, 2414, 2416, 2418, 2420, 2422, 2424, 2426, 2428, 2430, 2432, 2434, 2436, 2438, 2440, 2442, 2444, 2446, 2448, 2450, 2452, 2454, 2456, 2458, 2460, 2462, 2464, 2466, 2468, 2470, 2472, 2474, 2476, 2478, 2480, 2482, 2484, 2486, 2488, 2490, 2492, 2494, 2496, 2498, 2500, 2502, 2504, 2506, 2508, 2510, 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2844, 2846, 2848, 2850, 2852, 2854, 2856, 2858, 2860, 2862, 2864, 2866, 2868, 2870, 2872, 2874, 2876, 2878, 2880, 2882, 2884, 2886, 2888, 2890, 2892, 2894, 2896, 2898, 2900, 2902, 2904, 2906, 2908, 2910, 2912, 2914, 2916, 2918, 2920, 2922, 2924, 2926, 2928, 2930, 2932, 2934, 2936, 2938, 2940, 2942, 2944, 2946, 2948, 2950, 2952, 2954, 2956, 2958, 2960, 2962, 2964, 2966, 2968, 2970, 2972, 2974, 2976, 2978, 2980, 2982, 2984, 2986, 2988, 2990, 2992, 2994, 2996, 2998, 3000, 3002, 3004, 3006, 3008, 3010, 3012, 3014, 3016, 3018, 3020, 3022, 3024, 3026, 3028, 3030, 3032, 3034, 3036, 3038, 3040, 3042, 3044, 3046, 3048, 3050, 3052, 3054, 3056, 3058, 3060, 3062, 3064, 3066, 3068, 3070, 3072, 3074, 3076, 3078, 3080, 3082, 3084, 3086, 3088, 3090, 3092, 3094, 3096, 3098, 3100, 3102, 3104, 3106, 3108, 3110, 3112, 3114, 3116, 3118, 3120, 3122, 3124, 3126, 3128, 3130, 3132, 3134, 3136, 3138, 3140, 3142, 3144, 3146, 3148, 3150, 3152, 3154, 3156, 3158, 3160, 3162, 3164, 3166, 3168, 3170, 3172, 3174, 3176, 3178, 3180, 3182, 3184, 3186, 3188, 3190, 3192, 3194, 3196, 3198, 3200, 3202, 3204, 3206, 3208, 3210, 3212, 3214, 3216, 3218, 3220, 3222, 3224, 3226, 3228, 3230, 3232, 3234, 3236, 3238, 3240, 3242, 3244, 3246, 3248, 3250, 3252, 3254, 3256, 3258, 3260, 3262, 3264, 3266, 3268, 3270, 3272, 3274, 3276, 3278, 3280, 3282, 3284, 3286, 3288, 3290, 3292, 3294, 3296, 3298, 3300, 3302, 3304, 3306, 3308, 3310, 3312, 3314, 3316, 3318, 3320, 3322, 3324, 3326, 3328, 3330, 3332, 3334, 3336, 3338, 3340, 3342, 3344, 3346, 3348, 3350, 3352, 3354, 3356, 3358, 3360, 3362, 3364, 3366, 3368, 3370, 3372, 3374, 3376, 3378, 3380, 3382, 3384, 3386, 3388, 3390, 3392, 3394, 3396, 3398, 3400, 3402, 3404, 3406, 3408, 3410, 3412, 3414, 3416, 3418, 3420, 3422, 3424, 34

## Scythe Stones—

Pike Mfg. Co., 1901 list:
Black Diamond S. S. \$12.00
Lamoille S. S. \$11.00
White Mountain S. S. \$9.00
Green Mountain S. S. \$8.00
Extra Indian Pond S. S. \$7.50
No. 1 Indian Pond S. S. \$7.00
No. 2 Indian Pond S. S. \$6.50
Leader Red End S. S. \$6.50
Quick Cut Emery. \$6.00
Pure Corundum. \$7.00
Crescent. \$7.00
Emery Scythe Rifes. 2 Coats. \$8
Emery Scythe Rifes. 3 Coats. \$10
Emery Scythe Rifes. 4 Coats. \$12
Balance of 1901 list 33½%
Electro (Artificial). \$6.00
\$12.00. 33½%
Lightning (Artificial). \$6.00
\$18.00. 33½%

## Stoppers, Bottle—

Victor Bottle Stoppers. \$9.00
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## Stops—Bench—

Miller Falls. 15&10%
Morrill's. \$10.00. 50%
Morrill's. No. 2. \$12.50. 50%

## Door—

Chapin-Stephens Co. 50&10%
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## Plane—

Chapin-Stephens Co. 30%
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## Straps—Box—

Cary's Universal, case lots. 20&10&10%
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## Stretchers, Carpet—

Cast Iron, Steel Points, doz. 60@60&10%
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## Socket—

doz. \$1.00
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Excelsior Stretcher and Tack Hammer Combined, \$1.00. 20%
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## Stuffers, Sausage—

Enterprise Mfg. Co. 25@25&14%
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National Specialty Co., list Jan. 1, 1902. 30&5%
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P. S. & W. Co. 40&10&5%
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## Sweepers, Carpet—

Bissell Carpet Sweeper Co. \$1 doz.
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Superba, Crotch Mahogany. \$36.00
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Triumph, Fancy Veneers. \$33.00
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Parlor Queen, Fig. Rosewood. \$30.00
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Elite, Hungarian Ash. \$29.00
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Am. Queen, Fig. Mahogany. \$27.00
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Ideal, Bird's-Eye Maple. \$25.00
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Grand Rapids, Nickel. \$24.00
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Japan. \$22.00
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Standard, Nickel. \$22.00; Japan. \$20.00
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Crown Jewel, Nickel. \$21.00; Japan. \$19.00
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Crystal, Glass Top. \$18.00
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Grand, 17 in. wide. \$16.00
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Club, 17 in. wide. \$14.00
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Hall, 28 in. wide. \$10.00
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**NOTE.**—**Rebates.** 50c per dozen on three dozen lots; \$1 per dozen on five dozen lots; \$2 per dozen on ten dozen lots; \$2.50 per dozen on twenty-five dozen lots.

## Tacks, Finishing Nails, &amp;c.

American Carpet Tacks. 90@25%
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American Cut Tacks. 90@25%
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Suedes' Cut Tacks. 90@25%
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Suedes' Upholsterers' Tacks. 90@35%
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Gimp Tacks. 90@35%
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Lace Tacks. 90@35%
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Trimmers' Tacks. 90@25%
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Looking Glass Tacks. 65%
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Bill Posters' and Railroad Tacks. 90@40%
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Hungarian Nails. 80@10%
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Finishing Nails. 70%
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Trunk and Clout Nails. 80%
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**NOTE.**—The above prices are for Standard Weights.

## Miscellaneous—

Double Pointed Tacks. 90@4 or 5 tens
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See also Nails, Wire.

## Tanks, Oil and Gasoline—

Wilson & Friend Co.: Gasoline. Oil
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Gal. \$2.75
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60 \$2.50
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120 \$5.00
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## Tapes, Measuring—

American Asses' Skin. 50@25%
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Patent Leather. 25@30&5%
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Steel. 33 1/3-36%
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Chesterman's. 25@25&5%
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Kaufell & Ewer Co.: Favorite, Ass Skin. 40@10&50%
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Favorite, Duck and Leather. 25@30&10%
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Metallic and Steel, lower list. 33 1/3-35 5/8%; Pocket. 35@35&5/8.
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Lufkin's: Asses' Skin. 40@10&50%
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Metallic. 30@30&5%
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Patent Bend Leather. 25@30&10%
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Pocket. 40@40&5%
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Steel. 33 1/3@35 5/8%
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Wichnach & Hilger: Chesterman's Metallic, No. 34L etc. 33 1/3-36%
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Chesterman's Steel, No. 1038L etc. 33 1/3-36%
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## Teeth, Harrow—

Steel Harrow Teeth, plain or headed, 5/8-inch and larger. per 100 lbs. \$2.75@33 5/8%
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## Thermometers—

Tin Case. 80@10@80@10@5%
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## Ties, Bale—Steel Wire—

Single Loop. 80@10@5%
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Monitor, Cross Head, &c. 70@2 1/2%
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## Tinners' Shears, &amp;c.—

See Shears, Tinners', &c.
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## Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.
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## Tire Benders, Upsetters, &amp;c.—

See Benders and Upsetters, Tire.
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## Tools—Coopers'—

L. & I. J. White. 20@20@5%
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## Haying—

Myers' Hay Tools. 45%
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